

Low-viscosity structural epoxy adhesive

PRODUCT DESCRIPTION:

Pro-Struct Liquid Epoxy Adhesive is a two-component, solvent-free epoxy adhesive specially formulated for structural crack repair. It penetrates fine cracks to restore the structural integrity of concrete and can be used for pressure injection or gravity feeding. The durable, moisture-insensitive formula also works as a binder for patching mortar and ensures long lasting repairs.

PRIMARY APPLICATIONS:

- Repair cracks in structural concrete
- Pressure injection cracks in concrete, masonry and wood
- Sealing concrete pipes, tunnels, tanks, vaults and basements
- Seal concrete slabs against water and chlorides
- Anti-dusting and surface hardening for concrete
- Installing bolts, anchors, dowels and starter bars
- Binder for horizontal epoxy patching mortar

FEATURES & BENEFITS:

- Ultra-low viscosity, long pot life
- Pressure-injected or gravity-fed
- Cures in low temperatures
- Moisture insensitive
- High-strength structural adhesive
- Penetrates fine cracks

DIRECTIONS FOR USE:

Surface Preparation:

Surfaces must be clean, sound, dry or damp, but free of standing water. Exposed concrete surfaces must be sandblasted or chipped to show the well-bonded main aggregate. Steel should be prepared by mechanical means, free of rust, paint or foreign matter likely to affect the bond or performance of the repair

Mixing:

Pre-condition material to between 10°C to 23°C before using. Cut open pouch A and pour its contents into the empty clean container. Open pouch B and add to the container with Part A. Mix thoroughly for 3 minutes using a slow speed drill. Scrape the sides and bottom of the container to ensure all material is incorporated. Continue mixing for an additional 2 minutes.

Important: Complete mixing is essential to ensure full cross-linking of the components. Do not aerate mix nor mix by hand.

To prepare an epoxy mortar, slowly add clean fine well graded silica sand to a kit of mixed resin and mix to a uniform consistency.

Placement:

Refer to various methods specified for appropriate use.

TYPICAL PROPERTIES AT 25°C

Composition	Solvent-free epoxy
Compliance	ASTM C881 Types I and IV, Grade 1, Class B and C
Packaging	1 Litre kit, Parts A & B
Components	2
Mixing Ratio	2:1
Consistency	Thin liquid
Colour(s)	Clear Amber
Mixing	See mixing instructions for Burst Pouch
Pot Life	40 to 60 Minutes at 25°C
Application Method	Gravity pour or pressure inject
Application Temperature	4°C to 35°C
Coverage / Spread Rate / Yield	50 Linear metres/litre, 20mm deep, 1mm wide
Drying / Curing Time	Initial set: 12 Hours at 25°C 20 Hours at 4°C Service: 24 Hours Full cure: 3 Days
Cleaner	Clean equipment immediately after use with Lacquer Thinner and rinse with clean water
Shelf Life	2 Years in original, unopened container

Methodology for installation of bolts, anchors, dowels and starter bars:

Diameter of hole should be 1.25 to 1.5 times diameter of bar or rod. Depth of hole should be 10 times diameter of bar or rod for reinforced concrete and 15 times for mass concrete.

Allowable spacing and edge distance (D = anchor diameter)

	Distance for full anchor capacity (critical distance)	Distance for reduced anchor capacity
Edge Distance – Tensile Load	12D	4D
Spacing Between Anchors	24D	8D
Edge Distance – Shear Load	12D	4D

Methodology for crack injection:**Introduction:**

This methodology covers the surface sealing and injection of cracks in concrete structures using Pro-Struct Liquid Epoxy Adhesive and a High Viscosity Epoxy Adhesive or Sealant.

Method A (by pressure injection) – vertical walls:Nipple setting and surface sealing:

1. The crack must be inspected to ensure that it is clean and free of standing water.
2. Prepare a section of the concrete on either side of this crack by mechanical grinding or lightly sandblasting.
3. Using a masonry drill, drill a hole ± 8 mm in diameter into the crack to a depth of ± 20 mm. Once the hole is drilled, ensure that the crack can be seen at the bottom of the hole. This is important as quite often the crack does not go straight back from the surface into the body of the concrete. One further point to remember is that all remaining dust from the drilling must be removed from the holes.
4. The spacing of the holes will depend on the width of the crack with the following parameters being used as a guide:
 - a) Cracks up to 250 microns ± 150 mm centers
 - b) Cracks bigger than 250 microns ± 250 mm centers
5. Once all the holes are drilled, the setting of the nipples and surface sealing of the cracks can proceed.
6. A 6mm x 25mm standard grease nipple is used and this is set into position with High Viscosity Epoxy Adhesive. Care must be taken to ensure that the High Viscosity Epoxy Adhesive does not restrict the resin path during the setting process.
7. The balance of the crack between the injection points must then be surface-sealed in a band ± 80 mm wide with the Dural High Viscosity Epoxy Adhesive being applied 2mm thick directly over the crack. The High Viscosity Epoxy Adhesive must be allowed to set before proceeding.

Pressure injection:

1. Once Pro-Struct Liquid Epoxy Adhesive is thoroughly mixed, the injection can proceed starting from the lowest point and working upwards.
2. The Pro-Struct Liquid Epoxy Adhesive can be injected with a pressure gun or hand-operated grease gun. Injection should proceed slowly and nipples above the injection point should be vented with a straight pin (dressmaker's type) to check resin flow.
3. As soon as the resin is seen to exit the next higher nipple, the injection must move to this point. The process should continue until the resin has spread along the length of the crack. It is normally a good practice to return to the lowest point and repeat the operation again to ensure that the crack is completely filled and all air displaced.
4. On completion of the injection process, the Pro-Struct Liquid Epoxy Adhesive must be allowed to cure for ± 24 hours before removing the nipples and grinding the High Viscosity Adhesive flush with the concrete.

Method B (by gravity feed) – surface beds:Crack preparation:

1. Remove loose particles of concrete and vacuum clean. Ensure that the crack is clean, sound and dry.
2. Form temporary berm on either side of the crack with a bead of silicone or quick setting cement grout. Allow sealant or grout to set.

Gravity injection:

1. Mix the Pro-Struct Liquid Epoxy Adhesive as detailed above and then transfer into suitable pouring container.
2. Slowly feed the liquid resin into the crack over the entire length and continue the process until the crack is filled.
3. Allow the resin to penetrate and settle for ± 1 hour, then top up the crack until the material is flush with the adjacent concrete surface.
4. Allow the resin to cure for ± 24 hours before removing temporary surface berms and lightly sanding or grinding the concrete to remove surface stains, etc.

GENERAL:

The exact method of surface sealing will differ from application to application. However, suspended slabs are normally injected from the soffit with the top of the crack left open. Beams, columns and diaphragm walls should be sealed on all faces with nipples on one face only. Once again this can vary and will depend on the size of the crack, etc. Injection work has been done on retaining walls with backfill earth in position. The problem with this application is that the Pro-Struct Liquid Epoxy Adhesive tends to drain into the soil.

STORAGE:

Store in a dry area between 15°C to 30°C.

CLEAN-UP & SAFETY:

Wear protective gloves, goggles and body cover. Use in well-ventilated spaces. Clean tools immediately after use with a suitable cleaner and water.

PRECAUTIONS / LIMITATIONS:

- Application temperature of substrate to be 4°C and rising. Low temperatures adversely affect application spread rates and time to achieve bond.
- Hot temperatures decrease working time.
- Do not apply over wet surfaces.
- Do not thin with solvent.
- Use materials in strict accordance with the manufacturer's safety data sheet.
- Protective clothing and equipment will significantly reduce risk of injury.
- Body coverage apparel, safety goggles and impermeable gloves are recommended.
- In case of contact, flush with copious amounts of water and seek medical attention.
- Dispose of waste materials and containers in strict accordance with Government regulations.
- Pro-Struct Liquid Epoxy Adhesive is not UV stable and will discolour over time.

TECHNICAL INFORMATION:

Property	At 25°C
VOC	4g/litre
Solids Content	By volume: 100%
Compressive Strength	>60 MPa at 24 hours >73 MPa at 3 days
Concrete Bond Strength	Breaks concrete
12mm Rebar Pull-out Depth 126mm	Bar failure at 50KN
16mm Rebar Pull-out Depth 160mm	Bar failure 92.6KN
20mm Rebar Pull-out Depth 200mm	Bar failure at 140KN
Maximum Service Temperature	>50°C