

# Megapoxy

## High Pressure Crack Injection System

### DESCRIPTION

Pressure Injection Techniques can be used for injecting cracks, cold joints, and for soil stabilization. The system can be used to stop gushing water, to seal minor seepage, to re gain structural integrity and to waterproof and strengthen almost any concrete or masonry structure from the positive or negative side, below grade, above grade and under water.

Many practical methods have been established over the years for crack injection. While it is common to use "glue on" surface injection ports for some low pressure epoxy injection in dry areas, where there are thin concrete sections it is recommended to use mechanical packers for high pressure epoxy injection. Surface ports will not hold high injection pressures. Mechanical type packers are made for pressures up to 5000 psi in wet and dry structures.

The High Pressure Injection System described here has been proven to be extremely versatile, reliable and economical in resolving water and structural related problems in concrete structures.

For crack injections where structural strength is required, solvent-free, low-viscosity 2 component epoxy injection resins are used. The low viscosity, high internal strength and adhesive tensile strength of Megapoxy HX means it can be injected into cracks of > 0.1 mm crack width and fill the finest of fractures. This way the structural strength of the concrete, its load bearing capacity and its durability can be restored.

Please note; Epoxy Injection is generally not suitable for moving cracks.

### EQUIPMENT REQUIRED FOR INJECTION REPAIR

- 1) Grinder with diamond grinding wheel and crack chasing blade.
- 2) Vacuum or compressed air
- 3) Efficient mixing paddle
- 4) Spatulas and flat hard mixing board
- 5) Efficient electro-pneumatic drill and 13mm drill bit to suit mechanical packers and hole depth.
- 6) Grease gun with suitable attachments or purpose made hand/power operated pump. Capacity of 4000 psi.
- 7) Personal Protection Equipment



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## MATERIALS REQUIRED

- 1) Plastic protection film and masking tape
- 2) Epoxy thinners for clean up
- 3) Rags
- 4) Quantity of Mechanical Injection Packers, allow 3.3 per m of crack
- 5) Measuring containers
- 6) Epoxy paste, Megapoxy PM or Megapoxy PF
- 7) Low viscosity epoxy resin, Megapoxy HX or Megapoxy H

## INSTALLATION PROCEDURE

1) Epoxy resins can stain in both cured and uncured states and are difficult to remove. Mask up and use plastic drop sheets etc to protect surrounding surfaces from spills and leaks as necessary.

2) Cleaning of the surface of all loose concrete and contaminants helps to identify the exact location and the width of the crack to be injected. The crack must to be seen clearly in order to layout the drilling patterns for the injection holes and subsequent crack sealing. Remove laitance and any foreign materials by lightly diamond grinding the surface approximately 20mm each side of the crack. "V" the crack out with a crack chasing blade about 5mm deep or until solid concrete is evident.

3) Before drilling the injection holes, locate rebar and conduit, and plan the pattern to minimize hitting cast in obstructions.

The diameter of the injection hole shall be 8mm, 13 mm or 16 mm depending on the packer used. Packers are available in several diameters and lengths. The most common being 13mm x 70mm. The angle of drilling should be approximately 45 degrees or less to the surface and towards the crack. The depth of the drill hole intersecting the crack should be somewhere close to the centre of the cracked section. Holes deeper than 450mm are usually not required even if the concrete being repaired is more than 1m thick, as long as adequate pumping pressure is available and material is contained during injection. Holes should always be staggered from one side of the crack to the other. This assures a higher percentage of holes intersecting the crack, even if the angle of the crack within the concrete is not perpendicular to the surface.

The distance between holes can vary from approximately 300 to 600 mm according to the width of the crack. (Rule of thumb: 300mm) The wider the crack, the further apart the drill holes. If the concrete thickness is 150mm or less, do not attempt angle drilling, set the packers straight into the face of the crack.

Remove all dust with (oil free) compressed air or vacuum.

4) Place packers in the drilled hole, so that the top of the rubber sleeve is below the concrete surface. If the packer can't be pushed into the hole, tap it in. Tighten the packer with a wrench as tight as necessary. For critical areas such as corners and badly deteriorated surfaces, long versions of the regular packers are available to allow deeper insertion of the expandable rubber sleeve.

5) Fill the V section of crack with Megapoxy PM epoxy paste or similar. Over fill the crack and spread about 40 mm wide x 2mm thick. Seal both sides of the crack whenever possible.

6) The technician should be alert to;

- a. The crack and packers - for resin flowing out of the work face
- b. Pressure line; for pump pulsations indicating resin flow or noise of the pump under load.
- c. The gauge (if available) or force applied to hand pump for injection pressure.



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## INSTALLATION PROCEDURE CONT'D

Begin the injection at the point of highest resistance to ensure good penetration and minimal loss of chemical. This is usually the lowest point on a vertical crack and the narrowest area on a horizontal surface.

It is good practice to remove the zerk fitting from the packers 'ahead' to allow free travel of the resin..

If a pressure gauge is available, the pressure should be monitored and kept in a range that is just enough to allow sufficient flow of material. This procedure helps to minimize unforeseen events like sudden spills of material, blown out ports or spalling of defective concrete. In most cases keep pumping until the resin has traveled to the next packer, Continue in this fashion until the crack is completely filled. Re-inject each packer to desired pressure, usually about 4000 psi.

If the crack has not been sealed from both side of the structure a calculation as to how much epoxy is required to fill the crack will be necessary and injection ceased at each port as appropriate. In these cases it is important to choose the correct viscosity of the resin.

7) Once the injection work is completed, a good and thorough cleanup is essential, because once the resin hardens, it is almost impossible to dissolve it. Any resin spilled must be cleaned immediately before the resin sets. Clean the injection gun, mixers and any other tools that came in contact with the product thoroughly using a solvent, such as Megapoxy thinners. The packers can be removed within 12 hours and the holes can be patched. If desired, an electric grinder can be used to remove excess cured resin that flowed out the crack.

## SAFETY

Technical data sheets, MSDS and container labels must be read and understood before working with the products. Good ventilation must always be maintained when handling resins and solvents especially in confined spaces. Working with high pressures also creates certain risks. Loose injection packers have been known to slip out of holes. Face shields, rubber gloves and coveralls have to be worn at all times while working with construction chemicals. Cured material is extremely resistant to chemicals and most solvents.

## AVAILABILITY

Megapoxy Injection Guns are available for individual purchase. Packers are available in bags of 100. Megapoxy H and Megapoxy HX are both available in 4 litre and 20 litre kits.

