



ARDEX Concrete Injection Application Guide

Application guide for ARDEX T-Port System in conjunction with injection epoxies ARDEX RA 142, RA 144 and RA 146.

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DESCRIPTION

The ARDEX Crack Injection Systems use convenient flexible rubber bladders, ARDEX T-Ports, which act as resin reservoirs to allow continuous filling of cracks without constant 'gunning' of the epoxy.

INSTRUCTIONS

Always be sure the bonding surfaces are prepared in advance before starting a new cartridge or mixing product. If possible, schedule dispensing to consume an entire cartridge at one time with no interruption of the flow.

SURFACE PREPARATION

Old concrete must be clean, completely dry with no presence of moisture and profiled or textured. New concrete must be a minimum of 28 days old. Before using ARDEX Injection Epoxies, make sure that the surfaces to be bonded are sound and clean so there is no dust, dirt, grease, wax, oil, or any other contaminant present. Smooth surfaces should be mechanically roughened with a wire brush or sand paper before application.

CARTRIDGE SET-UP

Whilst preparing the cartridge, keep in an upright position to prevent material from leaking from cartridge.

1. Shake cartridge for 1 minute then stand cartridge upright for 1 minute allowing bubbles to rise to top.
2. Place cartridge into the dispenser, and hold the dispenser pointing upward at about 45° angle due to the product's low viscosity. Remove plastic cap and plug.
3. Dispense enough material into a disposable container until both resin and hardener flow evenly.
4. Insert the flow control port and then the nozzle to the top of the cartridge. Still holding the dispenser at about a 45° angle, slowly dispense the material up through the nozzle and dispose of 1-2 trigger pulls.

CRACK INJECTION SYSTEM FOR VERTICAL CRACKS

Before repairs are attempted, the crack should be analysed 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 with 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 caused by inadequate design, seasonal heaving, temperature swings or repeated over-loading.

Preparation

Clean the surface immediately surrounding the crack with a wire brush to achieve a 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.

ARDEX RA 84 or ARDEX RA 88 Plus is ideal to be used as capping paste for the crack injection procedure. Place and secure injection ports with ARDEX RA 84 or ARDEX RA 88 Plus, taking care not to leave any pin-holes. Port spacing should be approximately 15 – 30cm apart (typically the thickness of the concrete member). Do not allow the epoxy to block the passage between the port and the crack face. Place additional ARDEX RA 84 or ARDEX RA 88 Plus 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 paste. See ARDEX RA 84 or ARDEX RA 88 Plus for cartridge set-up.

Injection

1. Attach the tube assembly to the barbed end of nozzle.
2. Attach other end of tubing to the bottom injection port. Inject epoxy into port until there is flow from adjacent port or until epoxy stops flowing. Plug the port injected into and attach tubing to adjacent port. Continue procedure until complete.
3. Leave the tubing attached to the last port on each crack for 30 seconds under pressure to assure crack is completely filled.
4. 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

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. Use maximum 275 kPa (40 psi) air pressure. Excessive pressure may result in cartridge plunger leakage and can overfill ports.

For basement walls (where back side of concrete is not accessible) inject with slightly higher viscosity, ARDEX RA 146. This is a unique thixotropic gel that will feed into small cracks and bridge the back side without runoff.

Do not dispense epoxy through gelled mixer nozzle. If epoxy gels in nozzle, replace nozzle before continuing.

IMPORTANT

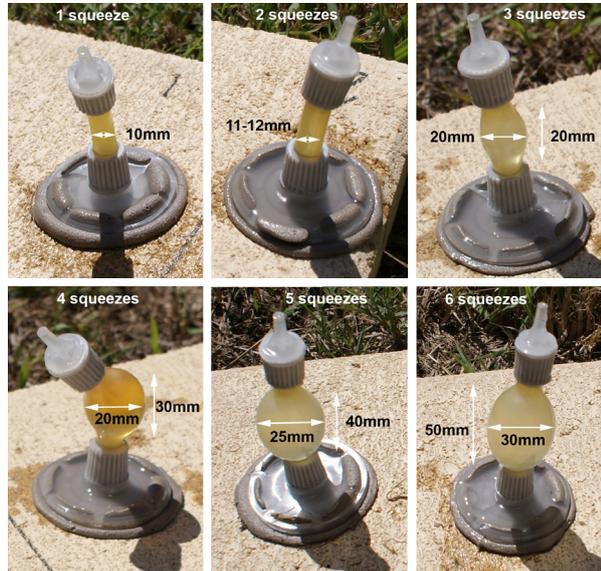
A point to be considered is that when the rapid curing epoxy resins are used, they generate significant heat at the gelling point, which can and has caused over-filled rubber bladders to fail and spray hot liquid resin. Measurements indicate that the RA 142 resin reaches temperatures exceeding 130°C in a filled bladder which can cause significant burns to skin if a splash occurs.

When injecting the resin into the T-Ports, we recommend that only a maximum of four (4) full squeezes of the gun trigger are performed at a time to fill the reservoir bladder. This amount of resin will result in a marble sized distension (swelling) of the rubber bladder to around 20mm in diameter. Do not fill the bladder to form a 'sausage shape'. Some schematics are shown on the right showing the sorts of sizes and shapes obtained from injecting progressively higher amounts of resin as measured by trigger squeezes.

If the bladder rapidly deflates then clearly the resin is dispersing, but if it retains a marble shape then the resin is not clearing and extra resin should not be injected.

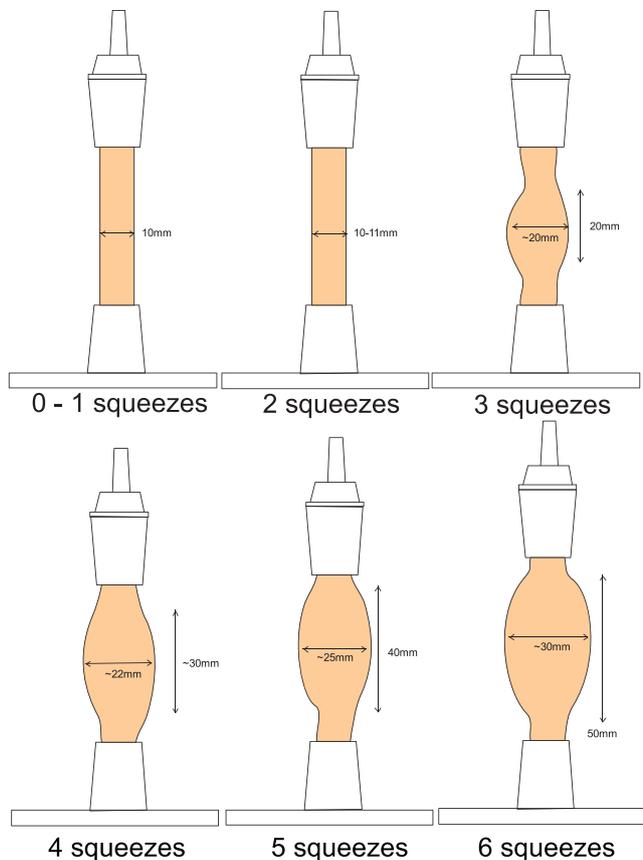
The recommendations made herein refer to T-Ports that have been correctly stored out the sun, and away from high temperatures, and are within their shelf lives. It should be noted that UV light, high temperatures and exposure to solvents and other aggressive chemicals age the rubber more rapidly.

The resins in question are ARDEX RA 142 and ARDEX RA 144 low viscosity liquid epoxy injection resins. The faster curing RA 142 generates a higher exotherm temperature and requires more care.



Photos of filled ARDEX T-PORTS showing approximate size and shape for a different number of resin cartridge gun trigger squeezes.

Note that 1-2 squeezes makes little visible difference in the bladder size.



Schematic diagram showing the approximate dimensions for full squeezes of gun trigger.

CRACK INJECTION USAGE ESTIMATING GUIDE

Crack Width (cm)	Concrete Thickness (cm)	Crack Injection Material	Capping Gel for Capping Crack
		Linear metres 470 ml cartridge	Linear metres 254 ml cartridge
1mm	10	5	2
	15	3.2	
	20	2.5	
	25	2	
3mm	10	3	1.9
	15	2	
	20	1.5	
	25	1.2	
5mm	10	1	1.8
	15	0.65	
	20	0.5	
	25	0.4	
6.5mm	10	0.75	1.7
	15	0.5	
	20	1	
	25	1	
8mm	10	2	1.6
	15	1.5	
	20	1	
	25	1	
9.5mm	10	1.5	1.5
	15	1	
	20	1	
	25	0.5	
11mm	10	1.5	1.4
	15	1	
	20	1	
	25	0.5	
13mm	10	1	1.3
	15	1	
	20	0.5	
	25	0.5	

DISCLAIMER

The technical details, recommendations and other information contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is your responsibility to ensure that our products are used and handled correctly and in accordance with any applicable Australian Standard, our instructions and recommendations and only for the uses they are intended. We also reserve the right to update information without prior notice to you to reflect our ongoing research and development program. Country specific recommendations, depending on local standards, codes of practice, building regulations or industry guidelines, may effect specific installation recommendations. The supply of our products and services is also subject to certain terms, warranties and exclusions, which may have already been disclosed to you in prior dealings or are otherwise available to you on request. You should make yourself familiar with them.

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