EPIREZ

TECHNICAL DATA

Episet Structural Adhesive

Epirez 8242

Episet Structural Adhesive is part of the **EPIREZ** range of structural adhesives for use in construction and industry. It combines ease of mixing and application with high strength performance, and features a non-sag, paste-like consistency before hardening. **Episet Structural Adhesive** is available in standard packs and in dual cartridges. **Episet Structural Adhesive** Gun Grade is especially suitable for grouting inserts into concrete.

A structural adhesive is a chemical compound that increases the quality and performance of jointed materials by more effectively enhancing the inherent strengths of the materials, while minimising their weaknesses. A structural adhesive can thus be viewed as part of a total system to increase an item's value by minimising costs and manufacturing involvement.

Episet Structural Adhesive has been used in major construction projects in the Asia-Pacific region for more than 25 years.

Areas of Application

- Joining and repairing concrete pipes
- Bonding precast concrete elements
- Bonding tiles to metal or concrete surfaces
- Repairing damaged and honeycombed concrete
- Grouting horizontal inserts into concrete
- Waterproofing concrete/steel joints
- Bonding metal, stone, wood, etc. to concrete
- Bonding external reinforcement

Features

- Excellent adhesion
- Good chemical resistance
- Gap filling qualities
- Equal part mix
- Colour coded mixing
- Bonds to most surfaces
- Proven usage

Last Modified March 2004

General Properties

Shelf Life	:	2 Years
Appearance of Hardener	:	Black Paste
Appearance of Compound	:	White Paste
Mixing Proportions by Weight or Volume	:	Equal Parts
Solids Content	:	100%
Colours	:	Grey
Work Time	:	45 Minutes at 25ºC
Hardening Time	:	24 Hours at 25ºC
Compressive Strength	:	70 MPa
Bond Strength (Concrete)	:	2.7 MPa *
Bond Strength (Steel)	:	15 MPa
Bond Strength (Timber)	:	5.0 MPa *
Chemical Resistance	:	Excellent
Peak Operating Temperature	:	90ºC
Code Compliance	:	ASTM C881-83, Type I, Grade 3

* Substrate failure

Estimating Data

1 Ltr Episet Structural Adhesive = 1 m^2 at 1 mm thick

Application Directions

Surface Preparation

All surfaces and cavities should be clean, dry and free from dust, loose particles, oil, wax, grease, etc, to ensure adhesion. Vacuum or brush cracks along entire lengths and, if possible, on both sides of the structure. Remove all foreign matter. Inserts should be threaded or deformed and should be degreased and blast cleaned to remove all contamination.

General concrete and steel items should be cleaned to industrially accepted standards.

Best results will always be obtained by captive blast cleaning to expose a sound substrate.

Very porous surfaces should be primed first with **Epoxy Primer/Sealer (123)**.

Surface preparation guidelines cannot cover all site or field contingencies and it is always recommended that an on-the-spot adhesion test be performed as part of the Standard Quality Assurance audit for the project.

STRUCTURAL JOINT DESIGN

Episet Structural Adhesive is ideal for bonding similar and dissimilar materials together to provide a high performance structural joint. The following points should be observed.

- Avoid butt joints-socket and lap joints provide much higher bonding strengths.
- Ensure materials to be joined are not under load or stress.
- Observe proper surface preparation.
- Correctly mix Hardener and Compound.
- Allow **Episet Structural Adhesive** to fully cure before loading and taking into consideration ambient temperature conditions.

Mixing

Standard Packs

With standard packs mix equal amounts of Hardener and Compound with a broad knife or spatula. Mix thoroughly until an even colour results.

Application

Spread the mixed adhesive onto both the prepared surfaces and close the joint. Support while hardening takes place.

Gun Grade

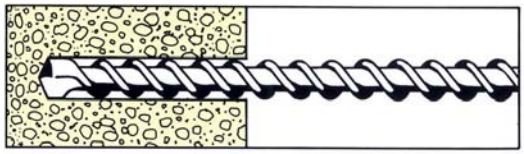
Insert Tightening Time : 3 Hours at 25ºC
Insert Loading Time : 3 Days at 25ºC

First estimate cartridges required from table below.

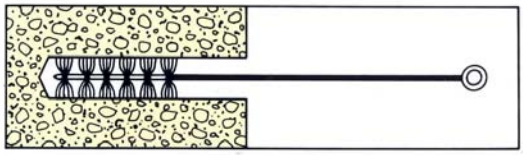
Insert Diameter (mm)	Hole Diameter (mm)	Hole Depth (mm)	Anchors per Cartridge (600ml)	Cartridges per 100 holes (600ml)
12	16	115	27	1.7
16	20	140	17	2.7
20	24	170	11	4.2
24	28	230	7	6.7

Then follow application sequence below:

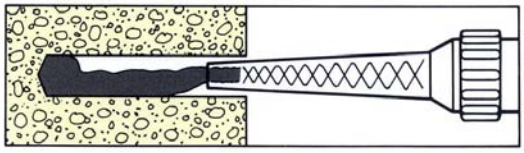
A. Drill hole to correct depth and size.



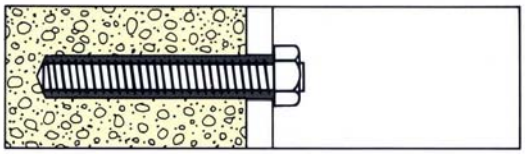
B. Remove debris from hole.



C. Unscrew cap from fresh cartridge and remove plugs. Cut tip of static mixer to desired hole size and screw onto cartridge. Load cartridge into EPIREZ Dual Cartridge Gun and dispense into prepared hole. Discard any initial unmixed material.



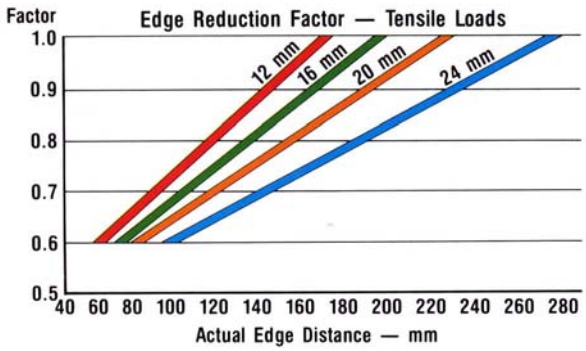
D. Finally place insert into hole and twist several times to ensure complete wetting out - adhesive should exude from hole. Observe tightening and loading times.

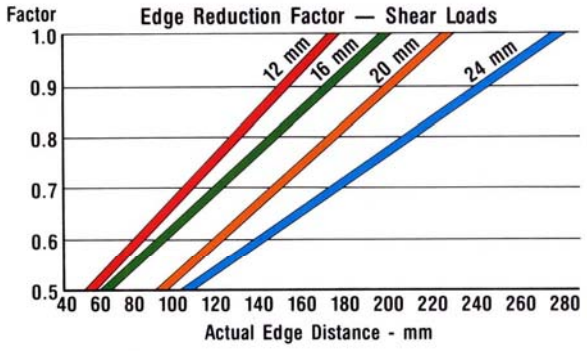


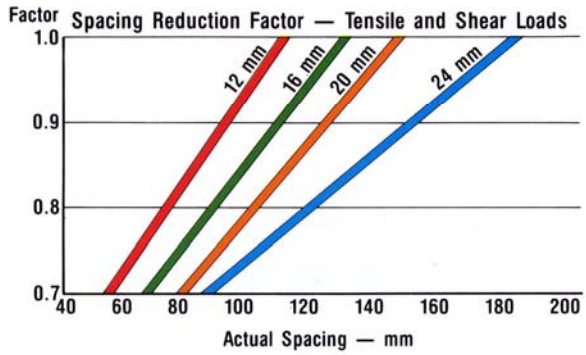
AUSTRALIA
ITW Polymers & Fluids
100 Hassall Street
Wetherill Park NSW 2164
Phone (02) 9757 8800 Fax (02) 9757 3855

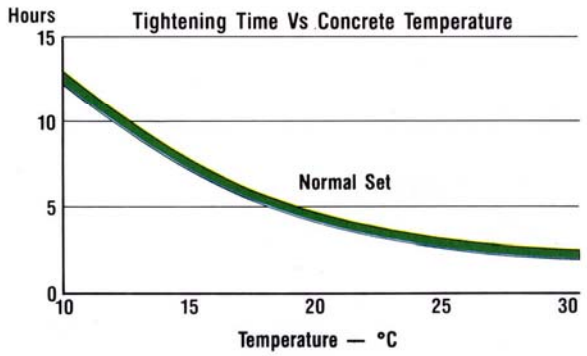
NEW ZEALAND
ITW Polymers & Fluids
18-26 Amelia Earhart Avenue
Airport Oaks, Mangere, Auckland
Phone (09) 256 2122 Fax (09) 256 2124

Engineering Performance









The data presented in the graphs above should be used as a guide only. Full design calculations should be carried out by a qualified structural engineer.

PULLOUT STRENGTHS IN CONCRETE

Insert Diameter (mm)	Hole Diameter (mm)	Hole Depth (mm)	Concrete Strength (MPa)	Ultimate Tensile Load (kN)	Ultimate Shear Load (kN)
12	16	115	32	57	55
16	20	140	32	74	60
20	24	170	32	115	85
24	28	230	40	225	140

NOTE: A minimum safety factor of 4:1 should be used for anchors in the compression zone of a structural member. Higher safety factors may be required for loads of a dynamic or fatigue nature. However, in all critical applications full design calculations should be carried out by a qualified structural engineer.

SPACING RECOMMENDATIONS

The load on an anchor is transmitted to the material in which it is installed. Loading of anchors in closely spaced clusters of two or more can result in interaction of forces on the base material and lead to a reduction in anchor performance. As a guide, the minimum distance between anchors or edge distance should not be less than the recommended Hole Depth. If these distances are reduced then consult ENGINEERING PERFORMANCE (graphs above) for load reduction factors.

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EXTERNAL REINFORCEMENT BONDING

Concrete floors, bridges and decks can be strengthened to increase their load carrying capacity by adding external reinforcement. The normal method to achieve these increases is to bond steel plates to the tension face of the beams or slabs.

Episet Structural Adhesive is ideal for this purpose. The stiffness is significantly increased and the tendency to crack under abnormal loading is reduced. There are two preferred methods for placing the steel plates on the structure after preparing both surfaces:

Fix the steel plate to the concrete leaving a 4-6 mm gap then seal the edges of the plate. Pump the **Episet Structural Adhesive** into the gap and allow to cure for seven days prior to returning the structure to operation.

Alternatively spread **Episet Structural Adhesive** over the surface of the steel plate and then press against the concrete and fix in place. The preferred method of applying pressure to the plates is with air bags. This enables easy control and ensures even distribution of pressure. Allow to cure for seven days.

RIGIDITY ENHANCEMENT RESULTS

Plate Size (mm)	Width to Thickness Ratio	Maximum Load (kN)	Deflection for 22 kN Load (mm)	Stiffness kN/mm	Increase in Rigidity (%)
No plate	-	24	42	0.41	-
57 x 4.75	12	40	15	1.29	215
85 x 3.6	24	43	15	1.29	215
123 x 2.14	57	42	16	1.29	215
150 x 1.06	142	34	22	0.69	68

Test beam 150mm (wide) x 190mm (deep) x 3.5m (long), 40 MPa Concrete.

Cleaning

Tools and equipment can be cleaned before hardening by washing in warm soapy water.

Storage & Shelf Life

Store in dry conditions between 10°C and 30°C, away from sources of heat and naked flames. Protect from frost. When stored in original sealed containers, the minimum shelf life is two years.

Packaging

Episet Structural Adhesive is available in standard 4 litre packs and ready-to-use 600 ml cartridges.

Ordering Information:

4 litre	#982427
600 ml cartridge	# 991675

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Safety Precautions

Avoid contact with skin and avoid breathing vapour. Wear gloves and goggles when mixing and using. Keep away from children. Provide adequate ventilation if applied in confined places. If poisoning occurs call Doctor or Poisons Information Centre. If swallowed **DO NOT** induce vomiting. Give plenty of water or milk. If skin contact occurs remove contaminated clothing and wash affected area thoroughly with soap and water.

TDG Code: Episet Structural Adhesive Standard Grade - Not Classified
Episet Structural Adhesive Gun Grade - UN1760

Note

The figures quoted for work time, tightening time, loading time and hardening time are not definitive. They are dependent on job site conditions and will vary accordingly. In all cases we endeavour to provide typical figures for use as a guide.

Health & Safety Information

The product is hazardous. A Material Safety Data Sheet is available from the ITW Polymers & Fluids Technical Department upon request or available on our website www.epirez.com.au .

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