



# ***Precision Grouting and Repair Systems***

*Ensuring long term structural integrity*

- EpiMax 111***
- EpiMax 225***
- EpiMax 480***
- EpiMax 480 Express***
- EpiMax 480 HTG***
- EpiMax 480 UT***
- EpiMax 480 UW***
- EpiMax 575***





## ***What needs to be considered for products used in precision grouting and concrete repair?***

- **Practical application characteristics**

The particular needs of the project including the practical aspects of access and application are important considerations.

EpiMax supplies systems that have been developed and proven over decades in very demanding applications. A key component of our R&D process is ensuring that we build error-tolerant systems which offer straightforward and repeatable field application.

We are also well equipped to develop innovative technology for new and challenging applications.

- **Reliable adhesion capability**

One of the critical factors governing the achievement of any effective concrete repair is good adhesion at the repair interface of the repair material and the concrete substrate. Concrete is a fundamental building block in the developed world. However, new concrete simply does not bond well to old concrete. Adhesion is also critical in precision grouting applications where loads need to be distributed throughout the foundation. Specify systems that are self-priming.

- **Non shrink curing**

The dimensional stability of any structural material refers to its potential to change shape or volume. If a repair mortar or a structural grout shrinks during the curing process, it cannot claim to be dimensionally stable. Shrinkage will at best, initiate mechanical stresses within the structure, and at worst, cause delamination or mechanical breakdown. Specify systems that offer non-shrink curing.

- **Adequate and controlled flow**

The ease with which a precision grouting system enters small cavities and travels under large structures is critical. A repair system also needs to make intimate contact with the micro-pores in the prepared concrete surface. Any tendency to separate during mixing or handling will cause problems. Well-engineered grouting systems operate as Newtonian liquids and have a linear relationship between shear rate and shear stress.

- **Mechanical performance**

The mechanical properties of any precision grouting system or concrete repair system can be very important. These performance characteristics include compressive strength, tensile bond strength, shear strength as well impact resistance. Not only must the system meet the requirements for the project, they must meet it reliably in the field application.

High performance applications also demand creep resistance and, sometimes, higher temperature ranges.

- **Inherent chemical resistance**

Concrete is a widely used engineering material. However whilst strong in certain mechanical aspects, unprotected concrete is extremely susceptible to a wide variety of chemical attack. The specification for repair system must address the chemical resistance requirements. Chemical resistance is also critical for machinery and foundation grouting applications.

- **Sustainability - whole of life**

Sustainability is related to the quality of life in a community - whether the economic, social and environmental systems that make up the community are providing a healthy, productive, meaningful life for all community residents, present and future.

With regard to protection systems, sustainability should consider the "whole product life cycle". This includes production, application, service life and disposal. Volatile Organic Content (VOC) is an important measure of a protection system's environmental impact. Our products meet or exceed the requirements of IEQ.13.1, Green Star Office Interiors, Indoor Environment Quality. EpiMax is a member of the Green Building Council of Australia.

- **Design life - budget compliance**

The first important question to ask when selecting a new system is - What is the required design life - 2, 5, 10 or 20 years? And, is frequent or regular maintenance feasible? It is virtually impossible to keep any concrete structure from cracking. Without proper protection, these cracks become the routes through which moisture, salt, acid rain and other chemicals can begin the degradation process on concrete remarkably quickly. The specification must meet the agreed design life and the intended maintenance-free period.



**EpiMax is your source** for the latest proven developments in precision grouting and repair systems. Our systems build on break-through technologies polymer technologies as well as adding proven science in aggregate grading and selection.

All too often, the correct choice and selection of aggregates is overlooked. Aggregates can simply be thought of as inert filler that is included simply for reasons of economy. However, closer examination reveals the complex roles and influences that the correct choice of aggregate plays in the properties of both freshly mixed and cured grouts and repair systems. Changes in composition, gradation and size will all alter the character and engineering performance of the mix.

In summary, aggregate science involves balancing the selection of, and the proportions between, coarse and fine high strength aggregates to match project placement methods, desired finish, cured performance and economy.

EpiMax offers a proven range of blended aggregates that are:

- Inherently high strength
- Silt and debris free
- Graded for particular applications
- Kiln dried
- Packaged in sealed plastic containers ideal for site storage

## Precision Grouting and Repair Selection Guide

Application	EpiMax Product	EpiMax Aggregate Grade	Product : Aggregate Volume Ratio	Compressive Strength Mpa
Precision grouting - 0.25 mm - 10 mm, single pour	EM 111	-	NR	105
Precision grouting - 10 mm - 45 mm, single pour	EM 480	-	NR	100
Precision grouting - 20 mm - 100 mm, single pour	EM 225	EA2	1 : 2	80
Precision grouting - 45 mm - 100 mm, multiple pours	EM 480	-	NR	100
Precision grouting - 45 mm - 100 mm, single pour	EM 480 UT	-	NR	98
Precision grouting - 100 mm - 150 mm, single pour	EM 480 UT	EA5	1 : 1	80
Precision grouting - 150+ mm, multiple pours	EM 480 UT	EA5	1 : 2	75
Precision grouting - 150+ mm, dry pack ram	EM 225	EA5	1 : 6	50
Repair - trowel-on, horizontal, workable	EM 225	EA2	1 : 3	70
Repair - trowel-on, horizontal, ram	EM 225	EA2	1 : 4	55
Repair - trowel-on, vertical	EM 225	EA4	1 : 4	50

Notes: Please contact EpiMax for full application guidance.

- 1 These are general recommendations. Always consult EpiMax in advance for specific requirements.
- 2 Depth of pour is affected by the exotherm of the product selected, which is influenced by product temperature, ambient temperature, thermal mass of surroundings etc.
- 3 With very deep pours, 12 mm steel reinforcement in the void will reduce stress cracking potential. Consult EpiMax for specific requirements.

# Typical Applications

## Industrial and Mining Equipment:

- *Presses and stamping machines*
- *Compressors and turbo machinery*
- *Process storage tanks*
- *Wind turbine foundations*
- *Precision grouting of mining equipment*
- *Weighbridge grouting*
- *Slew bearing grouting*
- *Test equipment grouting*
- *Structural anchoring*

## Transportation Grouting:

- *Train and crane grouting*
- *Road bridge grouting*
- *Tunnel construction*
- *Light rail anchoring*

## Structural Injection Grouting

- *Drying shrinkage*
- *Thermal contraction or expansion*
- *Settlement*
- *Lack of appropriate control joints*
- *Overload conditions/restraint of movement*

## Structural Concrete Repair

- *Spalled concrete repair*
- *Mechanical repairs*
- *Chemical protection*
- *Carbon fibre strengthening*



## EpiMax 111

An exceptional two-pack solventless epoxy system that offers a unique combination of properties for structural concrete injection in concrete construction, repair and maintenance.

- Low viscosity - reduces injection pressure
- Low surface tension - aids penetration
- High mechanical strengths - non shrink
- Resistant to a wide range of industrial chemicals
- Standard and Express grades available

## EpiMax 225

A two-pack solventless epoxy binder system that can be used for a variety of applications in concrete construction, repair and maintenance.

- Multi-purpose use - aggregate extendible
- Excellent adhesion to wet or dry surfaces
- High mechanical strength
- Resistant to a wide range of industrial chemicals
- Potable water approved

## EpiMax 480/480UT

A two-pack solventless precision epoxy grouting system that offers excellent and reliable OEM equipment support as well as for general concrete construction and repair.

- Easy mixing - aggregate extendible
- Excellent flow - long life option with EpiMax 480 UT
- Non shrink - low exotherm
- High mechanical performance
- Chemically resistant

## EpiMax 480 Express

A two-pack solventless precision epoxy grouting system that offers fast hardening for rapid return to service for equipment and construction applications.

- Easy mixing - aggregate extendible
- Excellent flow
- Fast hardening - quick return to service
- High mechanical performance
- Chemically resistant

## EpiMax 480 HTG

A two-pack solventless precision epoxy grouting system that offers higher temperature capability than traditional epoxy grouts.

- Easy mixing - aggregate extendible
- Excellent flow
- Fast hardening - quick return to service
- High temperature capability
- Chemically resistant



## EpiMax 480 UW

A two-pack solventless epoxy grouting system especially developed for splash zone or underwater applications. It has the ability to displace water by spreading over the surface, remaining immiscible with water and ultimately displaying a higher affinity for the surface than water does.

- Easy mixing - aggregate extendible
- Performance cure - even underwater
- Fast hardening - quick return to service
- Impermeable to chloride ions
- Corrosion resistant



## EpiMax 575

Easy-to-use, two-part epoxy paste hardens after mixing with excellent properties ideally suited for many building and construction site applications. Available in Standard and Express grades.

- Excellent adhesion under adverse conditions (cold and damp)
- Good chemical resistance, Kevlar reinforced
- Good strength retention after prolonged immersion in water
- Tensile and compressive strength superior to concrete
- Construction Grade approved for segmental construction bridge work



## Case Study - certified flow, certified strength

Fiberglass Reinforced Plastic (FRP) has been used to build corrosion resistant mineral processing storage tanks for more than 40 years. The operating conditions associated with mineral processing often require materials of construction that can withstand process acids and acid chlorides at temperatures up to 90°C.

However these tanks must be grouted securely to the concrete foundation, otherwise they can crack and leak during service.

EpiMax 480 UT Precision Extreme Life Epoxy Grout was selected for a critical project in New Caledonia where exceptional flow, (up to 14 m) through varying gaps (< 1mm to 25 mm), and strict mechanical performance was required before third party certification was achieved.

EpiMax supplied more than 50,000 litres of performance grout over a 4 week time frame for this very demanding project.

## Application

### Safety precautions

Read Material Safety Data Sheet before commencing any application. Keep away from children. Avoid contact with skin and eyes and avoid breathing/vapour. Always provide adequate personal protection (gloves & goggles etc) during use. Always provide adequate ventilation, especially in confined spaces. If poisoning occurs, call Doctor or Poisons Information Centre. Phone 13 11 26. If swallowed, DO NOT induce vomiting. Give plenty of water or milk. If skin contact occurs, quickly remove contaminated clothing and wash affected areas thoroughly with soap and water.

### General surface preparation

Concrete should be at least 28 days old. Ensure foundation is clean, dry and free of additives, curing agents, oils, etc. Prepare the foundation by professional diamond grinding to expose firmly adhered aggregate. Surface profile should exceed CSP 3. Scrub with clean water and then vacuum. Allow surfaces to dry. Always confirm preparation adequacy.

### Mixing

Keep product and aggregates cool before use. Review the area in advance so that a fixed volume of mixed material can be applied over a fixed area to ensure correct application rate. Select a slow speed (400 rpm) mechanical mixer and ensure thorough mixing. Then add components. Mix until uniform. Discard unused product when the work time is exceeded. Work time may be difficult to visually determine, so always keep track of actual time. Always protect from rain for 24 hours after application. Avoid application when relative humidity is >80% and temperature is <12°C.

### Curing

Follow curing instructions before subjecting to full use.

### Equipment

- Gloves, goggles and personal protection
- Measuring containers
- Mixing containers
- Power mixer
- Pails for pouring grout
- Sealant to stop leaks in forms
- Duct tape
- Extra forming material and tools, wood saws, hammer, nails

### The Don't list

- DON'T alter the specified mix ratio
- DON'T try to mix aggregates if wet; always keep dry and sealed
- DON'T add solvent, water or any other material to the product
- DON'T use product that's stuck to the mixer
- DON'T use product that contains spots or streaks after mixing
- DON'T make new mixes in buckets containing partially cured product
- DON'T place onto unprepared surfaces



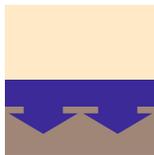
***Environmentally sustainable***



***Resistance to abrasion and impact***



***Durable***



***High adhesion***



***Resistance to chemicals***



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