



EPIREZ<sup>®</sup>

# TECHNICAL DATA

## General Purpose Epoxy Mortar Binder

### *EpiRez<sup>®</sup> 133*



#### Description

**General Purpose Epoxy Mortar Binder (133)** is a truly remarkable product. First developed in 1970, it now has the unique distinction of being the most widely specified epoxy based construction product.

Essentially **General Purpose Epoxy Mortar Binder (133)** is a multi-purpose epoxy binder suitable for a wide variety of applications. This multi-purpose capability allows construction sites and maintenance teams to stock one product and still solve many problems.

**General Purpose Epoxy Mortar Binder (133)** has set the performance standards for epoxy binders in the building and construction industry and has earned a reputation for foolproof use under field conditions.

**General Purpose Epoxy Mortar Binder (133)** is a solventless epoxy mortar or concrete binder designed for applications demanding high structural integrity and a proven history of successful use. **General Purpose Epoxy Mortar Binder (133)** offers low mixed viscosity, hydrophobic characteristics (bonds to wet surfaces) and fast hardening to produce mortars and concretes exhibiting excellent adhesion, high compressive and tensile strengths and exceptional resistance to the entry and passage of water and corrosive ions.

High strength mortars and concretes are conveniently prepared by combining **General Purpose Epoxy Mortar Binder (133)** and **EpiRez<sup>®</sup> Aggregates**.

**General Purpose Epoxy Mortar Binder (133)** has been independently tested and meets the requirements of AS/NZS 4020 - 2002 for use in contact with potable water.

#### Areas of Application

- Structural bonding of new to old concrete
- Structural repair of spalled concrete and masonry
- Grouting of load bearing bolts and supports in concrete
- Splash zone repairs to concrete and timber piled structures
- Skid proofing of concrete and timber
- Bonding steel to concrete

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The information contained in this Technical Bulletin is as up to date and correct as possible as at the time of issue. The data provided should be used as a guide only as the performance of the product will vary depending on differing operating conditions and application methods.

The sale of any product described in this Technical Bulletin will be in accordance with ITW Polymers & Fluids Conditions Of Sale, a copy of which is available on request. To the extent permitted by law, ITW Polymers & Fluids excludes all other warranties in relation to this product.

## Features

- Multi-purpose use
- Low viscosity
- Excellent adhesion to wet or dry concrete
- Low temperature cure
- High mechanical strength
- High chemical resistance
- Non-shrink
- Aggregate extendible

## General Properties (Binder Only)

Shelf Life	: 2 Years
Appearance of Hardener	: Colourless Liquid
Appearance of Compound	: Colourless Liquid
Mixing Proportions	: 1 Hardener to 3 Compound
Solids Content	: 100%
Work Time	: 30 Minutes at 25°C
Tack Free Time, as a Coating	: 6 Hours at 25°C
Hardening Time	: 24 Hours at 25°C
Compressive Strength, Ultimate	: 95 MPa
Compressive Modulus	: 3.4 Gpa
Tensile Strength, Ultimate	: 55 MPa
Water Permeability	: $2 \times 10^{-17}$ m/s

## Estimating Data

1 L General Purpose Epoxy Mortar Binder (133) = 1 m<sup>2</sup> at 1 mm thick

4L General Purpose Epoxy Mortar Binder (133) + 16L Patching & Flooring Mortar Aggregate (QA2) = 4 m<sup>2</sup> at 4 mm thick

## Application Directions

### Surface preparation

Remove all loose, crumbly and drummy areas to obtain a sound surface. Captive blast clean or acid etch to expose firmly held aggregate. Ensure that surfaces are free of dust, oil and grease. Dampness can be tolerated.

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.

### Mixing

Measure sufficient Hardener and Compound to be used in 30 minutes. Mix thoroughly using a low speed power mixer. Ensure that all the material on the sides and on the stirrer are incorporated. Take care to avoid air entrapment in the mix.

If extending with **Epirez® Patching & Flooring Mortar Aggregate (QA2)** follow guide in table below. **Epirez® Patching & Flooring Mortar Aggregate (QA2)** is kiln dried (with a moisture content below 0.2%) and supplied in a sealed drum. Care should be taken to keep aggregate dry after opening.

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## Recommended General Purpose Epoxy Mortar Binder (133) / Patching & Flooring Mortar Aggregate (QA2) Mixes

Characteristics	Binder / Aggregate Ratio by Volume	Litres Binder per m <sup>3</sup>	Litres Aggregate per m <sup>3</sup>	Compressive Strength MPa
Very Fluid Grout	1:2	450	900	80
Flowable Mortar	1:3	333	1000	70
Easily Worked Mortar	1:4	250	1000	55
Dry Pack or Ram	1:5	200	1000	50

### Structural Bonding New to Old Concrete

**General Purpose Epoxy Mortar Binder (133)** has been used on many major projects to structurally bond new to old concrete. These applications result in strengths significantly greater than the concrete mixes involved, and in tensile, shear or flexural tests separation at the bond line will not occur.

Apply mixed **General Purpose Epoxy Mortar Binder (133)** using a broom or squeegee at a rate of 3-6m<sup>2</sup>/litre over the cleaned surface. Porous, absorbent surfaces may need more. Immediately pour concrete whilst film is still wet. Allow concrete to cure normally. If delay occurs beyond 60 minutes at 25°C, recoat with **General Purpose Epoxy Mortar Binder (133)**.

New to Old Bond Strength : 105% University of Arizona Test

### Structural Repair of Spalled Concrete and Masonry

**General Purpose Epoxy Mortar Binder (133)** can be used to repair damaged concrete and masonry structures. Correctly applied, the completed repair will demonstrate higher strengths than the original structure.

Prime cleaned surfaces with mixed **Epirez® Epoxy Primer/Sealer (123)** by brush, roller or airless spray. Prepare a trowellable mortar by mixing 1 volume mixed **General Purpose Epoxy Mortar Binder (133)** and 3 volumes **Epirez® Patching & Flooring Mortar Aggregate (QA2)**. Place this mortar over the freshly primed areas and trowel to a smooth finish. Minimise air content. This mortar exhibits excellent adhesion. Remove splash and spatter from adjacent surfaces before hardening occurs.

Tensile Strength	: >10 MPa
Concrete Bond Strength	: 2.7 MPa (Concrete Failure)
Compressive Strength	: 70 MPa
Flexural Strength	: >20 MPa
Water Permeability	: $1.2 \times 10^{-16}$ m/s
Resistance to Chloride Ion Penetration	: Excellent

### Grouting of Load Bearing Bolts and Supports in Concrete

**General Purpose Epoxy Mortar Binder (133)** grouts offer significant advantages over cement-based products. Rapid hardening, chemical resistance, good performance under dynamic loading and ability of grouted elements to be set close together and close to edges are just some advantages.

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Bolts and bars are best grouted with a grout mix 1 volume of mixed **General Purpose Epoxy Mortar Binder (133)** and 1% - 2 volumes of **Epirez® Patching & Flooring Mortar Aggregate (QA2)**. Use hole diameters of 1% times insert diameter. Smaller inserts (10mm diameter and less) can be grouted with mixed **General Purpose Epoxy Mortar Binder (133)** unextended.

Inserts should be free of oil, grease and dust and preferably grit blasted to "bright metal" condition. Holes should be clean of dust and debris. Wet holes should be free of standing water.

Pour mixed **General Purpose Epoxy Mortar Binder (133)** or mixed **General Purpose Epoxy Mortar Binder (133)** and **Epirez® Patching & Flooring Mortar Aggregate (QA2)** into the holes and insert bolts or bars.

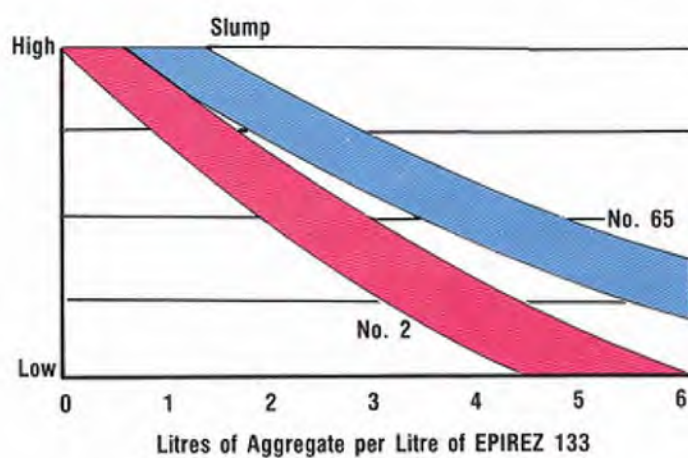
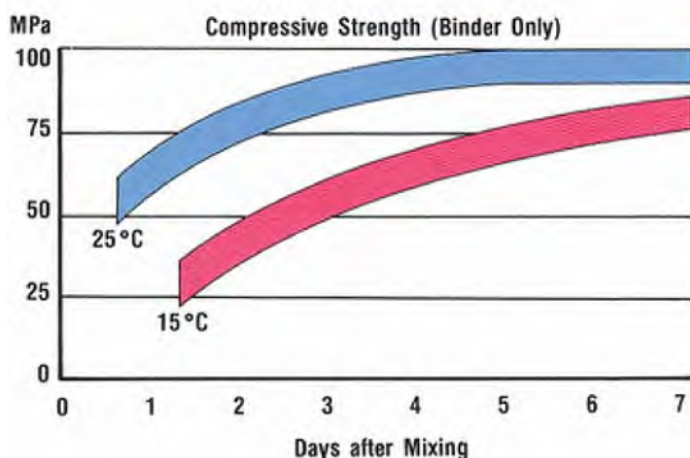
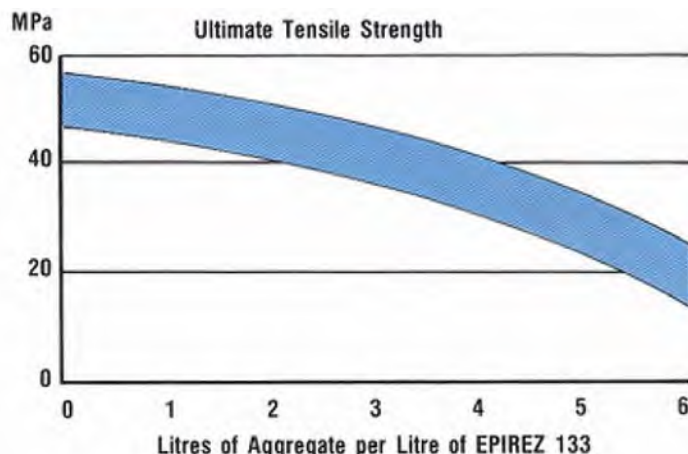
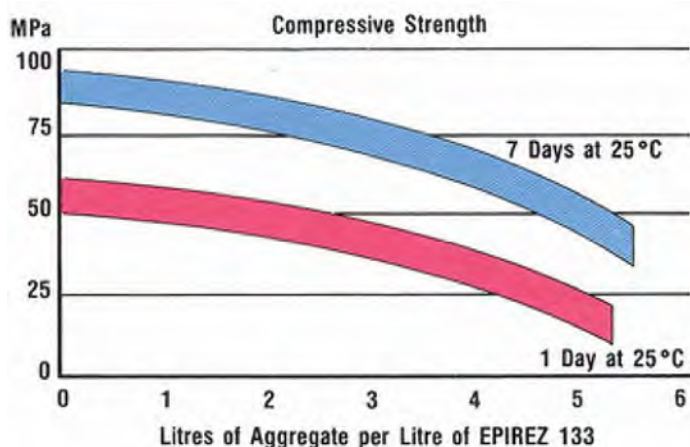
### Typical Pull Out Strengths (40 MPa Concrete)

14mm deformed bar (embedded 150mm) > 50 kN	Bar Fails
14mm threaded bolt (embedded 110mm) > 50 kN	Bar Fails
25mm deformed bar (embedded 225mm) >150 kN	Concrete Fails
25mm threaded bolt (embedded 175mm) >150 kN	Concrete Fails

Safe Working Load Factors are available from ITW Polymers & Fluids Technical Department on request.

Bearing plates should be surrounded with formwork protected with a suitable Release Agent and a flowable mortar consisting of **General Purpose Epoxy Mortar Binder (133)** and **Epirez® Patching & Flooring Mortar Aggregate (QA2)** poured into the void.

### Engineering Performance



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## Underwater and Splash Zone Repairs to Concrete, Timber and Steel Structures

**General Purpose Epoxy Mortar Binder (133)** has excellent underwater adhesion to most structural members and it easily displaces water in formed up voids.

Surfaces should be grit blasted to expose firmly held aggregate and then primed with **General Purpose Epoxy Mortar Binder (133)**. An underwater grout mix should be prepared (1 volume mixed **General Purpose Epoxy Mortar Binder (133)** and 1 1/2 volumes **Epirez® Patching & Flooring Mortar Aggregate (QA2)**) and poured to displace water.

Underwater repairs may show higher strengths due to better compaction if the grout mix is poured through a 50 - 75mm diameter PVC conduit or hose.

### Compressive Strength Underwater (Placed and cured under sea water at 20°C)

Compressive Strength : 50 MPa

### Tensile Bond Strength Underwater (Placed and cured under sea water at 20°C)

Steel to Concrete : 2.5 MPa Concrete Fails  
 Concrete to Concrete : 2.5 MPa Concrete Fails  
 Steel to Timber : 3.5 MPa Timber Fails

### Pile Restoration Tests

(Placed and cured under sea water at 20°C and based on Compressive Strengths of the pile) **Concrete Piles**

Eroded Pile : 71% of new pile  
 General Purpose Epoxy Mortar Binder (133) repaired pile : 111% of new pile

### Timber Piles

Eroded Pile : 26% of new pile  
 General Purpose Epoxy Mortar Binder (133) repaired pile : 104% of new pile

### Skid Proofing of Concrete and Timber

**General Purpose Epoxy Mortar Binder (133)** may be used to skid proof concrete and timber surfaces by using the "Spread and Sprinkle" technique. Apply mixed **General Purpose Epoxy Mortar Binder (133)** to the prepared surfaces at a rate of 6m<sup>2</sup>/litre using a long nap roller. Broadcast an excess **Epirez® Patching & Flooring Mortar Aggregate (QA2)** and allow to harden overnight. Sweep off excess and apply a second coat of **General Purpose Epoxy Mortar Binder (133)** to seal the surface.

For areas demanding high traction levels use **Epirez® Epoxy Anti-Slip Flooring Aggregate (Sil-Carb)**.

### Cleaning

Tools and equipment may be cleaned before hardening commences by washing with **Epirez® Clean Up Solvent**. Do not use for cleaning hands or mixing with product.

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## Storage and 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

**General Purpose Epoxy Mortar Binder (133)** is available in 1 litre, 4 litre and 20 litre packs. Each pack contains Hardener and Compound in the correct proportions for use.

## Ordering Information:

1 litre	#E901333
4 litre	#E901332
20 litre	#E901334

## 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 spaces. If poisoning occurs call a Doctor or Poisons Information Centre. If swallowed **DO NOT** induce vomiting. Give plenty of water or milk. If skin contact occurs remove any contaminated clothing and wash affected area thoroughly with soap and water.

**TDG Code:** Hardener - UN 1760 Compound - Not Classified

## Note

The figures quoted for work time, tack free 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](http://www.epirez.com.au).

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