HYCHEM
INTERNATIONAL PTY LTD

E200 DATA SHEET

HIGH PERFORMANCE EPOXY GROUT

DESCRIPTION

HYCHEM E200 is a proven high strength epoxy based grouting product, offering a unique combination of features and benefits. The product develops high compressive strength, even at low temperatures. It is designed for grouting gaps ranging 2mm – 10mm.

E200 is designed to be specified when fast mechanical strength development, long term non shrink performance, high chemical resistance and excellent dynamic load response are important.

USE

HYCHEM E200 is suitable for the foundation grouting of machinery base plates, rail grouting or under column grouting typically found in new construction work or new machinery installation and alignment.

It can also be used for structural concrete bonding and repair by low-pressure injection into narrow voids in concrete floors, walls, columns and beams. Properly used, this process can return cracked concrete elements to original design strength and at the same time, waterproof the structure.

HYCHEM E200 is also suitable for grouting bolts, rebar, dowels & inserts in concrete, rock and brickwork. The pull-out performance and durability of all mechanical inserts and anchors are maximised when professionally grouted with this system since HYCHEM E200 grouts exhibit two to four times the compressive strengths and 10 to 15 times the tensile strength of concrete. Through uniform stress distribution, the completed system also functions as shock absorbers, minimising the chance of failure.

TYPICAL APPLICATIONS

Grouting – Machinery base, rail, column foundation, injection, anchoring bolts, rebar, dowels and inserts in concrete, rock and brickwork.

- Food & Beverage production facilities
- Heavy manufacturing and mining (extensively used in the steel industry)
- Water treatment plants
- Wharves and Ports
- Chemical Plants

FEATURES & BENEFITS

- Very high mechanical strength – compressive, tensile and flexural.
- Excellent dynamic load tolerance.
- Very fast development of strength.
- Excellent flow – works well in tight clearances where maximum flow and highest performance are paramount.
- Resistant to a wide range of chemicals.

Although E200 is designed for pours in the range 2-10 mm it can be modified on site for pours up to 20 mm. If this is a requirement then contact the technical department at Hychem.

PHYSICAL PROPERTIES (@ 25°C,50% RH)

- **Solids content:**
  100%
- **Pot life:**
  20 mins
- **Cure time:**
  Foot Traffic - 24 hrs
  Full Cure - 7 days
- **Initial cure:**
  65 MPa after 8 hrs
- **Hardness (ASTM D2240):**
  75 Shore D
- **Tensile strength (ASTM D412):**
  30 MPa
- **Compressive strength (ASTM D695):**
  115 MPa
- **Flexural strength:**
  40 MPa
- **Adhesion to concrete:**
  Concrete failure

HYCHEM E200 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

CHEMICAL RESISTANCE

Epoxy grouts have excellent resistance to acids compared to cementitious grouts and are often chosen for grouting in mines and chemical plants. E200 is also resistant to oils, fats, petrol, water and alkalis.

APPLICATION GUIDELINES

Surface Preparation

Sub-Base Preparation

Ensure foundation concrete is properly cured. All surfaces should be clean and free from rust, dust, oil, wax, grease and standing water. Concrete should be scabbled if necessary to remove any weak, crumbly materials. Formwork should be treated with release agent where required. The foundation should be shaded from direct sunlight to prevent build up of excessive temperatures.

Plate and Equipment Preparation

The bonding surfaces of the base plate to be grouted should be free of coatings, wax, grease or scale. Wax or mask all external areas likely to be affected by rising grout.

Forming

Forms must be liquid tight and ideally should have a moveable head sloped at 45 deg to enhance grout placement. The top of the form must be a minimum of 18 mm above the equipment being grouted; edges should be a minimum of 25 mm from each base plate.

Mixing

The resin is mixed with hardener at the designated mix ratios. Mix mechanically at 400 rpm for approximately 2 minutes then scrape down sides and continue mixing for a further 1 minute. Ensure both components are thoroughly mixed together before placement. The product must be mixed slowly to minimize the incorporation air.

Temperature Conditioning

Grouting supplies are sometimes stored in the field at ambient temperatures above 30°C. Wherever possible, cool the components before mixing.

Pre-chill the sealed pails of grout in a tub of ice. Ideally cool the grout to 20°C. Work time varies temperature. In general, work time is halved for every 10°C temperature rise.

Applying

Under plates

Pour mixed materials slowly into the prepared void from one side only and fill the cavity continuously to avoid air entrapment.

Structural concrete injection grouting

Cracks in concrete can be caused by a variety of reasons, including drying shrinkage in the concrete structure itself, mechanical overloads, external chemical attack or internal processes (concrete cancer).

HYCHEM E200 has a role to play in the repair of any of these situations, but mechanical overloads and concrete cancer rectification require the overall direction of a qualified building / mechanical engineer.

In general, cracks in concrete become unacceptable if they are likely to cause one or more of the following:

- Local structural weakness
- Ingress of moisture leading to steel corrosion and concrete spalling
- Unsightly appearance.

We cannot provide specific application procedures for all projects here, but we have endeavoured to provide a general overview of a typical situation.

Contact HYCHEM Technical Service for more information on this application.

Recommendations here refer to non-engineering and non-concrete cancer related repair.

Repair of Drying Shrinkage Cracks

HYCHEM E200 is suitable for:

- Gravity or capillary action, suitable for floor slabs
- Vacuum suction, suitable for walls
- Low pressure injection, suitable for most situations

The general process of pressure injection is carried out in the following sequence:

- Clean the crack with oil free compressed air.
- Apply a surface seal along the crack and establishing entry ports at intervals of 300mm.
- Inject the HYCHEM E200 system through the entry ports, starting from the lowest.
- Curing under atmospheric conditions for several days. Note that the pressure of injection must be carefully controlled, being around 0.75 MPa in general application and not exceeding 1.5 MPa in any case. Too much pressure may tend to force the crack planes apart or to force out the surface seal. Complete filling of the crack can be confirmed by coring along the crack after repair. Contact HYCHEM Technical Service for more information on this application.

Anchoring bolts, rebar, dowels & inserts in concrete, rock and brickwork

HYCHEM E200 grout can be used to anchor a variety of bolts, reinforcing bars and dowels into portland cement concrete, rock and brickwork. The performance and durability of any purely mechanical anchor will be greatly improved with HYCHEM E200.

We cannot provide specific application procedures for all projects here, but we have endeavoured to provide a general overview of a typical situation.

Contact HYCHEM Technical Service for more information on this application.

Hole Diameter

In general, specify hole diameters 1.5 times insert diameter. With large diameter inserts (>100mm) this factor can be reduced. As the annular space decreases, grout placement becomes more difficult and care must be taken to avoid entrapping air, which degrades strength and creep properties.

Depth of Embedment

Concrete tensile strength and the depth of bolt embedment determines the pull-out load. The anchor depth should be designed to provide bolt failure when tested in tension.

Hole Spacing

Hole spacing is important to avoid stress interaction caused by holes spaced too closely together or near the edge of the structure. A good guide for minimum spacing is 10 times the bolt diameter for bolt spacing and five times the bolt diameter for edge spacing.

Drilling and Substrate Preparation

Best results are obtained when the holes are dry cut by rotary-percussion drilling. This drilling method is preferred because it produces a rougher cut, providing a better key for the grout. After drilling, the holes should be scrubbed with a stiff non-metallic brush and blown out with oil free compressed air. Where holes are to be precast, they should be cast undersize and drilled to obtain the desired annular space.

Surface Preparation of Inserts

Inserts should be dry and free from contaminants, such as rust, dirt, oil, and grease. Rust should be removed.

Rust-protective storage films must be thoroughly removed with degreasing solvents. Test adhesion first. Once installed, HYCHEM E200 provides excellent corrosion protection.

HYCHEM E200 Placement

Smaller inserts (10 mm diameter and less) are best grouted with neat HYCHEM E200. For larger inserts, combine 1 volume of freshly mixed HYCHEM E200 and 1.5 volumes of suitable aggregate. Mix thoroughly without entrapping air. On horizontal surfaces gravity feed is acceptable, but on vertical and overhead surfaces, use appropriate cartridge or gun systems.

Air entrapment in horizontal and overhead applications can be avoided by beginning placement of the mixed HYCHEM E200 at the bottom of the hole. The nozzle of the mixer or the gun should be adapted so that the outside diameter of the nozzle tip is just slightly under the diameter of the hole. This will allow the nozzle to be displaced outward as the adhesive material is extruded into the hole.

SAFETY PRECAUTIONS

- Wear goves, eye protection and overalls during mixing and application
- Ensure there is adequate ventilation and avoid breathing its vapour.

PACKAGING

Kit size	Colour Packs Required
3 Lt	N/A
30 Lt	N/A

SHELF LIFE

This product has a shelf life of 12 months from date of manufacture, stored under shelter at 25°C in original un-opened container.

COMPLIMENTARY PRODUCTS

E200 is one product in the Hychem epoxy grout range. PF1 and E250 compliment the range and with these three products it is possible to service grouting applications with thickness's ranging from 2 mm to > 400mm.

Epoxies generate heat as they cure and as grout jobs can require large volumes in a single pour the potential for significant heat development exists. It is therefore important to select the correct product for your application.

Please contact Hychem for any assistance required.

DISCLAIMER

The technical information and application advice given in this publication is based on the best information available at the time of print. As the information herein is of a general nature, no assumption can be made as to the product suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by Commonwealth or State Legislation. The owner, his representative or the contractor v is responsible for checking the suitability of products for their intended use.

HYCHEM INTERNATIONAL PTY LTD

Hychem International Pty. Ltd.
ACN 003 248 959
www.hychem.com.au
admin@hychem.com.au

Head Office
3/19 Burns Rd
Heathcote NSW 2233
02 9548 2186

VIC/TAS
2/35 Garden Rd
Clayton VIC 3168
02 9562 4660

QLD
7/11-17 Cairns St
Loganholme QLD 4129
07 3209 8999

SA/NT
61 Bacon St
Hindmarsh SA 5007
08 8346 4111