



# HYGROUT 210

Low exotherm, deep pour, high performance epoxy grout

HYGROUT 210 is a three component, high performance epoxy grout. It is designed to exhibit low exotherm during curing enabling it to be used in deep pours and at elevated application temperatures. HYGROUT 210 has high strength and low creep.

## USE

It is recommended for:

- Grouting machinery base plates
- Grouting rails
- Grouting anchor bolts
- Repairing damaged concrete

## FEATURES AND BENEFITS

- Low heat generated during cure making it suitable for deep pours up to 450mm
- Low shrinkage allows final levelling of machine base plate before grouting
- Long pot life for easy handling and placement in hot climates
- High compressive strength
- Excellent creep resistance ensuring it maintains its multi-dimensional support under constant load
- Suitable for pours between 80mm and 450mm
- Pre-packaged aggregate – optimum design flowability for deep pour
- Excellent adhesion to concrete and steel
- Chemical resistant – resistant to a wide range of chemicals
- Faster curing and higher strength than cementitious grouts

## TYPICAL APPLICATIONS

- Foundation grouting of base plates
- Rail track anchoring and grouting
- Steel and concrete columns/structures grouting
- Structural anchoring of bolts, dowels and re-bars
- Machinery subject to dynamic movements eg: pumps, gear boxes, compressors and generators
- General grouting in corrosive environments

## TYPICAL PERFORMANCE

Epoxy grouts have much higher physical performance capabilities than cement grouts, with 3 times the compressive strength and up to 10 times the tensile strength. They are also more impact resistant and withstand cracking due to mechanical vibrations. Individual epoxy grouts vary depending on whether they are formulated for high or low temperature use, minimal cost or specific flow and creep properties.

The placement depth of an epoxy grout is dependent on the heat released during cure and the resultant shrinkage and cracking forces that occur. HYGROUT 210 is formulated to provide the longest working time to enable the grout to be placed in large volumes and deep pours. At ambient temperatures of 23°C the recommended maximum pour depth in a single application is 450mm.

## PHYSICAL PROPERTIES

Mix ratio by weight	1.6:0.8:20 (Resin:Hardener:Aggregate)
Cure time @ 25°C	Initial – 24hrs Full – 28 days
Compressive strength ASTM C 579-01	100 MPa
Modulus of Elasticity	14 000 MPa
Flexural Strength ASTM C 580-02	32 MPa
Tensile strength ASTM C 307-99	17 MPa
Peak exotherm ASTM C 307-99	27°C
Gel time ASTM D 2471-99	approximately 6 hours
Linear shrinkage ASTM C 531-00	0.002%
Bond Strength ASTM C8882	30 MPa
Creep ASTM C 1181-00	0.001 mm/mm 20°C 4MPa 0.006 mm/mm 82°C 4MPa

## PACKAGING

22.4kg – yields 10.25 litres  
89.6kg – yields 41 litres

## APPLICATION GUIDELINES

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The resin, hardener and aggregate of HYGROUT 210 need to be conditioned to a temperature between 18°C and 30°C before grouting. The grouting area needs to be protected from cold, hot and wet conditions before grouting start and for at least 24 hours after grout placement.

### Surface Preparation

- Concrete shall be fully cured for a minimum of 28 days and with a compressive strength of 25MPa and surface tensile strength of 2.0MPa minimum.
- Remove surface laitance, contaminants, coating, curing compound and all weak and loose materials.
- Roughen concrete surface by Chipping, Diamond Grinding, Scarifying or Grit Blasting to provide the appropriate surface profile for optimum bonding. 50% of the surface should be exposed aggregate.

If the grout will extend out horizontally beyond the machinery base by more than about 25cm then edge lifting may become an issue. If this is the case there are a number of ways to combat it including installing dowels. Consult a Hychem representative for further information.

### Base Plate Preparation

- Base plate surfaces that will be in contact with the grout should be sand-blasted to white metal surface. No oil, grease.
- The plate can be coated with an epoxy primer if the grouting is not happening immediately. If left for more than a few weeks then the surface should be prepared again.
- Sharp edges in contact with grout should be rounded reduce stress concentration in the grout. Sharp edges can result in stress cracks in the grout.

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

The following guidelines are suggested.

### Hole diameter

Should generally be 1.5 times the insert diameter. This can be reduced for large insert diameters above 100mm.

### 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.

### Epoxy grout placement

To avoid air entrapment, the liquid grout should be filled bottom up using enough head pressure to achieve the desired flow rate and distance.

### Form Work

- Use good quality form material and ensure it is strong and leak proof. Any gaps should be sealed with an appropriate material such as silicone sealant. The forms should be coated multiple times with a grease or floor wax to aid removal after curing.
- Forms should rise about 25mm above the base plate to contain the flowing grout.

- Forms at the sides of the plate should be placed at about 40mm from base plate edge. Forms at the grout entry and exit ends should be placed at least 75mm out to allow room for flow and manoeuvring. To aid the placement of grout under sizeable base plates it is beneficial to use a moveable header box. This controls the flow of grout and directs it forward under the machine while minimising the incorporation of air. It should be slanted away at an angle of 45 degrees.
- When grouting long sections it is recommended to install expansion joints. This reduces the chance of cracks, due to differences in linear thermal expansion and contraction between the grout and concrete.

### Mixing

- Mix HYGROUT 210 liquid components (resin and hardener) together using a slow speed power mixer at a speed of approximately 250rpm until the mix become homogeneous (~ 2 minutes).
- Add the resin mix to a mortar mixer, add the aggregate and mix at approximately 25 rpm until all aggregate has been wetted.
- Avoid over mixing as this will increase air incorporation.
- The amount of aggregate can be reduced slightly to increase the flow in cold conditions or where application requires. The aggregate must not be reduced by more than 15% since it will adversely affect the properties and increase the likelihood of a resin rich layer at the surface. Hychem should be consulted.

### Placing Of grout

- Grout should be placed immediately after mixing
- Check for any leakage regularly. Leakage can cause voids

### CLEAN UP

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Xylene can be used for cleaning tools and equipment before the mixed compound begins to harden.

### SHELF LIFE

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HYGROUT 210 has a shelf life of 12 months from date of manufacture if stored under shelter and at 25°C in original un-opened container.

### SAFETY PRECAUTIONS

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

#### Field support

Field support where provided, does not constitute supervisory responsibility. Suggestions made by HYCHEM either verbally or in writing may be followed, modified or rejected by the owner, engineer or contractor since they and not HYCHEM are responsible for carrying out procedures appropriate to a specific application.

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