

## Super Fluid Micro Concrete

### Information

Winner of the Smart Award for Innovation, **Ultracrete MC** is a super fluid micro concrete for large section repairs. It is a very dense low permeability material, which does not suffer damage from frost attack and freeze/thaw conditions. The product does not contain any chlorides, sulphates, amorphous silica or harmful chemicals.

### Technical

**Ultracrete MC** is supplied in 25kg bags and complies to, Department of Transport BD27/86 – Materials for repair of concrete highway structures.

Conforms to clause 1704.6 Control of Alkali Silica Reactions.

### Preparation

Remove all affected concrete from the repair zone and fully expose reinforcement bars, ensuring that at least 50mm of clean sound reinforcement steel is evident either end. Disc cut extreme edges of repair zone to ensure a minimum edge of 10mm. Steel reinforcement bars should be thoroughly cleaned preferably by grit blast process to remove all active rusting. If alternative methods of cleaning are employed, i.e. mechanical wire brush, needle gun, particular care should be taken to ensure the rear of the bars are cleaned. If during survey analysis chlorides were identified, wash steel and concrete faces with clean water.

All surfaces within the repair zone should be free from dirt, oil, paint, and laitance, roughened by light scabbling or grit blasting. Formwork must be of good quality materials (ideally marine quality plywood), with surface coated in varnish or mould release oil. All joints must be sealed to ensure "grout tight" seal, the use of silicone or mastic is advisable.

Offer the formwork to the repair zone ensuring minimum depth of 10mm at the edges and 50mm within the repair area. Maximum thickness should not exceed 175mm. The formwork should be flooded 2-3 hours before the material placing with clean water to ensure all surfaces are soaked. Approximately 30 minutes before placing material, drain water from within the formwork, ensuring that no ponding exists.

### Chemical Resistance & Durability

When used in accordance with the instructions, **Ultracrete MC** is a very dense low permeability material, which does not suffer damage from frost and freeze/thaw conditions. The product does not contain any chlorides sulphates, amorphous silica or harmful chemicals. It's impermeability means it is highly durable and resistant to petrol, diesel, anti-freeze liquid and de-icing salts.



### Features & Benefits

#### Winner of the Smart Award for Innovation 2002.

**Ultracrete MC** is a super fluid high performance micro concrete ideal for large section structural concrete repairs.

- Shrinkage compensated with hydration control system (HCS).
- Compatible with cathodic protection techniques.
- Exceptionally fluid.
- Will not segregate or bleed.
- Manufactured under Quality Management System BS EN ISO 9001: 2000.

#### Recommended Applications

Large section repairs. structural repairs, highway structures.

### Related Products

**Ultracrete AR**

Acrylic Curing Membrane.

## Precautions

Repairs should not be carried out when surface or air temperature is below 5°C or above 30°C. Shutter/material should not be vibrated. Light, but not excessive tapping of the shutters is permitted.

## Mixing

**Ultracrete MC** should be mixed in a forced action mixer. Small quantities can be mixed using a grout type paddle and slow speed drill. Part mixing is not advised. Always add powder to water. Add 2.9 – 3.3 litres of clean quality drinking water per 25kg bag. Do not exceed water content. Mix for 3–5 minutes to obtain a smooth lump free consistency.

## Placing

Place mixed material within 20 minutes of mixing. Ensure placement is carried out in a continuous process until the shutter is full. Material should be agitated whilst waiting to be applied. **Ultracrete MC** can be pumped; it is recommended that a piston type pump be employed. Always ensure pipes are well primed with a cement/water slip prior to pumping. An amount of **Ultracrete MC** should be pumped to clear priming solution prior to placement.

## Curing

Formwork should be kept in place for a minimum of 36 hours. Once struck all exposed faces should be cured. This can be carried out by application of **Ultracrete AR**, a light misting of faces with clean water or taped polythene sheeting.

## Cleaning

**Ultracrete MC** should be removed from tools and equipment with clean water immediately after use. Cured material can be removed mechanically, or by acid etching.

## Health & Safety

This product contains cement which, when mixed with water is strongly alkaline and may cause skin irritation. Operatives should wear protective clothing and work in well-ventilated conditions.

If the product enters the eyes, wash thoroughly with clean water. If discomfort continues seek medical advice. In common with all powder products, the product should be mixed carefully, avoid raising dust.

## Physical Properties – Ultracrete MC (formerly known as Cemflow MC)

The following results were obtained at a fluid consistency (i.e. 4.8L of water per 25kg bag), tested by SGS (UK) Ltd at 20°C. (Report Ref: 6580/910/M).

Test Carried Out	Age	N/mm <sup>2</sup> at 20°C	N/mm <sup>2</sup> at 5°C
Compressive Strength	1 day	20.0	–
	2 days	30.0	–
	3 days	38.0	–
	7 days	55.0	–
	10 days	–	42.0
	28 days	72.0	68.0
Tensile Strength	28 days	4.2	–
Flexural Strength	28 days	8.9	–

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<b>Flow in a Trough</b>	
Immediately After Mixing (5°C)	5.1 seconds
30 Minutes After Mixing (5°C).	5 seconds
Immediately After Mixing (20°C)	5.0 seconds
30 Minutes After Mixing (20°C)	5.1 seconds
Initial Setting Time, Hrs: Mins	6:30
Final Setting Time, Hrs: Mins	9:00
Expansion Characteristics, %	1 – 2
Fresh Wet Density, kg/m <sup>3</sup>	2200
Air Content	5.0%
Chloride Ion Content,	<0.02%
Equivalent Sodium Oxide	<3Kg/m <sup>3</sup>
Portland Cement Content	480kg/m <sup>3</sup>
Portland Cement /Cement replacement material content	750kg/m <sup>3</sup>
Co-efficient Thermal Expansion	10.6 x 10 <sup>-6</sup> /°C.
Initial Surface Absorption Test (Taywood)	Test show Ultracrete MC too impermeable to be recorded
Carbon Dioxide Diffusion 50mm Ultracrete MC =	550mm Concrete
Taywood Method)	219 metres equivalent air thickness
Resistivity – (4 point Wenner) 28day	12633 ohm.cm-1

<b>Packaging</b>	<b>Ultracrete MC</b> is supplied in 25kg polythene lined bags. Deliveries from our factory on shrink wrapped pallets.
<b>Shelf Life</b>	Store in a dry place at temperatures between 5°C – 30°C. Shelf life in correct conditions for sealed bags is 6 months. High temperatures and high humidity will lead to a reduced shelf life.
<b>Yield</b>	13 Litres (approx) Allowance should be made for wastage when evaluating quantities required.
<b>Colour</b>	Grey.

For updated Material Safety Data information visit [www.instarmac.co.uk](http://www.instarmac.co.uk)

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