

# HARDONATE MC

## Free Flow Micro Concrete

### DESCRIPTION

**HARDONATE MC** is a cement based non-shrink concrete reinstatement mortar. The select grading of aggregates and special additives ensures that there is no segregation when pouring, that the thermal coefficient of the cured product matches that of the concrete, that the product has improved strength and is less permeable. The product is supplied in a ready to use form requiring only the addition of a small amount of water for easy mixing to produce a fluid consistency.

### ADVANTAGES

- **Excellent adhesion with parent concrete, positive grip with reinforcement**
- **High early and final strength**
- **Efficient restoration material**
- **Compensation for shrinkage and settlement in the plastic state**
- **High fluidity enables placing without Vibration**
- **Easy to use**
- **Pre - packed system - overcomes the batched weight variations**

### FUNCTION

**HARDONATE MC** is a non-shrink cementitious micro concrete with 5 to 12mm down aggregates, for repairs and restoration of reinforced concrete elements. The excess of adhesion property of **HARDONATE MC** enables the placing in awkward locations also. This can then be applied 50 mm or thicker into suitable shuttered repair areas.

### USES

**HARDONATE MC** is compatible for use with different concrete grades and can be used for slim sections also.

**HARDONATE MC** is widely used in repairs where conventional concrete placing and vibrating is difficult in case of reinforcement congestion.

**HARDONATE MC** is an ideal material for structural strengthening of columns, beams etc. by encasement.

**HARDONATE MC** can be used for repairing larger sections by mixing with 5-12mm aggregates in the proportion of 50 to 100% by weight of micro-concrete.

### TYPICAL PHYSICAL PROPERTIES

Compressive strengths – Mpa	
ASTM C109	
1 day	16
3 days	28
28 days	58
Wet expansion	0,07%
Drying shrinkage	0,07%
Wet density	2 265 kg/m <sup>3</sup>
Water Addition	2,7 litres per 25 kg
Yield	12 litres / 25 kg
Flow property	975 mm per 20 sec

### METHOD OF APPLICATION

#### SURFACE PREPARATION

The substrate must be sound, firm and clean, free of oil, grease, loose particles and cement laitance, old layers of paint, or other contaminants.

Square cut all edges to be repaired to a minimum depth of 10 mm, perpendicular to the surface followed by the removal of all unsound material.

The rest of the repair area must then be broken back to a depth in excess of 50 mm. Never feather edge the product. When using compressed air for cleaning, the air must be clean and oil free.

Assess the initial adhesion or the effectiveness of the degreasing by means of pull-off tests.

Expose all corroded reinforcing steel and grit blast. A clean metallic finish is required ensuring that all corrosion products are removed, particularly behind the steel. The anchor pattern should be about 40 to 60 microns from peak to valley. **HARDONATE MC** is designed to be cast into and restrained by formwork. This formwork should be well designed and fixed to prevent no loss of material or movement causing poor and unacceptable workmanship. Allowance should be made for the initial drainage of water and the formwork material must be non-absorbent.

Surface saturation is carried out at least four hours prior to placing **HARDONATE MC**. This is achieved by filling the prepared formwork with clean water and

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draining just prior to placing **HARDONATE MC**. It is important that all excess water is drained with no free water remaining.

The Parent concrete must be applied with **HARDONATE MC** the epoxy-bonding agent for proper adhesion where the bond strength must be equal or greater than the parent material. If this option is used, the substrate must remain dry. **HARDONATE MC** has to be poured to the areas by providing encasements.

All exposed reinforcing bars must be primed by applying **PRIMER ZR**.

**HARDONATE MC** should be kept in a water pond for 7 days for curing to attain good strength.

### MORTAR PREPARATION

A suitable size mixing vessel that will accommodate full bag lots using a pan mixer for forced action mixing is recommended.

For small batches a heavy duty industrial drill and spiral paddle stirrer that operates around 400 to 500 r/min can be utilized. In either event tumble type mixers are not permissible. Add approximately 2/3 of the required mixing water and while stirring, slowly add the powder and mix until lump free. Add the remainder of the water and mix for 3 to 4 minutes until the mortar is again completely homogeneous and lump free.

It is recommended that the mixed **HARDONATE MC** be passed through a suitable coarse screen to identify any unmixed material prior to placing or pumping.

For small mixes with a drill and paddle the complete water addition must be used at once.

Always add powder to water. The fluid mortar can now be poured into the water tight formwork.

**CAUTION:** High-speed mixing entraps an excessive amount of air and therefore should be avoided.

### APPLICATION

**HARDONATE MC** can be pumped or poured into the formwork provided.

This should be done as a continuous operation and must take place within 30 minutes of mixing. Thereafter the product characteristics will change, affecting its fluidity and expansion properties.

The pump and pipeline must be thoroughly lubricated by pumping a rich cement slurry or mortar through the system, which is then discarded and immediately followed by pumping the product.

Always pour or pump from one side only to avoid air entrapment.

The formwork should be left in place for at least 24 hours until the compressive strength of the **HARDONATE MC** is 10 MPas or higher.

**HARDONATE MC** should be cured as soon as the formwork is removed. First soak all exposed areas of the repair with clean water. This is followed by applying, by brush or spray, a suitable water base curing compound.

In rapid drying conditions caused by high winds or direct sunlight additional precautions should be included, like sealing with polythene sheeting. This may include damp hessian behind the sheeting to prevent moisture loss.

In cold conditions, the repaired area must be protected from freezing. For additional protection properties, **HARDONATE MC** is fully compatible with the **MITCHELL'S** range of protective coatings when chloride and carbon dioxide screening is essential.

### PACKAGING

**HARDONATE MC** is available in 25 Kg packing.

### YEILD

50 kg of **HARDONATE MC** powder mixed with 5.4 liters of water yields approximately 24 liters.

### SHELF LIFE

**HARDONATE MC** has to be used within 12 months from the date of manufacturing. It has to be stored in original bags to protect from dampness.

### SAFETY

Avoid contact with eyes or sensitive skin. Wash thoroughly with plenty of water if eyes or sensitive skin gets affected.