



# MODCON®

CREATING CONCRETE SOLUTIONS

## MLC TECHNICAL SPECIFICATIONS DOCUMENTATION

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If you can draw it we can make it

## **INTRODUCTION OF MODCON LIGHTWEIGHT CONCRETE (MLC)**

In 1999 **MODCON** introduced a polymer modified system calling it **MLC (Modcon Lightweight concrete)**, it has similar properties to cement in that over time, exposure and rain it gets stronger, which makes it ideal for external or internal use.

**MLC** is lightweight products with fair physical strength with excellent fire resistant properties. Our products have been used in many of S.A. Buildings i.e.: Monte Casino, Gold Reef Casino and Emperors Casino and many more.

**MLC** is mainly used as a laminate system using special polycrop woven mesh. This gives the final composite a strong light weight structure similar to polyester fibreglass (GRP), however without the problems of flammability or plastic looking effect of GRP.

### **Features of MLC**

- Grey in finish
- Good rating for flammability ( SABS 0177 Part 3 - Class 1 - Not tested)
- Dimensional stable ( less than 0.5% change on cure)
- Compressive strength of over 30MPa
- Working temperatures of up to 80 Degrees C
- May be machined afterwards
- Surface will accept most masonry paint finishes including sealers
- Mould surfaces may be polished when fully cured
- Non Toxic
- Good Impact resistance

### **Fire Performance**

Evaluation of fire properties of **MLC** panels to be assessed by CSIR of South Africa.

### **Hail Resistance**

At present tests are being performed to determine tests of suitable thickness and laminates. However due to good impact resistance (nominal Charpy 30kJ/m<sup>2</sup>) a laminate of 6 - 8mm should withstand standard 10 year extreme hail damage test.

### **Weathering and Ultra Violet**

Extensive QUV tests have been done on the materials with different finishes. **MLC** is unaffected by UV degradation. However some finishes may fade due to the high concentrate of pigmentation. It is recommended to use **MLC** additives such as pigments, granules and metals. If used externally, NO sealer is required. We normally do not add pigments to our finishes, due to fading over time.

### **Chemical Resistance.**

Alkali and acids Excellent

Solvents and Hydrocarbons not recommended

Water and Salt water (Not immersed) Good

Immersion in Water and salt water Fair - Recommend sealer

### **Heat Resistance**

MLC is resistant to temperatures from -10 to 150 Degree Celsius. .

### **Modcon Lightweight Concrete (MLC) APPLICATION GUIDE**

#### **Preparation**

Mixing of the components should be done at room temperatures (18 to 25 Deg C). Colder temperatures will slow working / cure time, while warmer temperatures will reduce working time. Do not freeze the liquid or latex portion "A"

#### **Mould Release Agents.**

Depending on the type of mould surfaces will determine the type of release agent.

#### **Flexible Moulds**

#### **Silicone Moulds**

A release agent is not necessary, normal release agent to be used.

#### **Rigid Moulds**

It must be noted that rigid moulds that have sides that go up vertically or have undercut flanges could cause a problem if they are not removable. This also goes for castings that have an inside and outside mould such as pots, etc. **MLC does not expand so tight mouldings are possible.**

#### **GRP (Fibreglass ) or Metal Moulds**

Normal release agents.

### **Shelf Life**

MLC Latex liquid "A" compound is made of a number of components and may settle out on standing for a long period. Please shake container before dispensing. All MLC products are made to a standard specification and have been laboratory tested. Shelf life is 6 months. In the event of the product sitting for more than 6 months a small sample should be tested before using.

MLC "B" compound is stable for 1 year as long as no moisture is allowed into the bag. , Ensure that it is kept in dry conditions. Do not store on concrete floor.

### **Measuring and Mixing**

Prior to starting ensure you have the following products

MLC A and B Measuring containers

Dust Mask Mixing vessel

Mechanical Stirrer (use paint mixer on end of variable drill)

Accurate scale, however volume may be used

Fillers, etc

Use a dust mask before beginning. Use an accurate scale.

Component ratio below is an example of 1kg, however will depend on the size of your mix.

### **RATIO IS 3:1 by mass**

Place 250 gm of MLC liquid "A" into a 1 litre vessel.

Measure out 750gm of the MLC Powder "B" component into a 1 litre vessel. Add if necessary any other fillers, Stir together using a mixer.

Now put liquid under stirrer and start stirrer. Add powder into the middle of the vortex of the liquid slowly; ensure that it remains creamy at all times (similar to applying flour to milk/water). Mix in all the powder until fully mixed, make sure there are NO dry lumps. It is best to set the mixer speed to about 600 to 800 RPM.

**You have about 25 minutes working time to apply mixture.** As you can either cast with the mix or laminate with it, the alternatives are explained below

## **Casting/ Pouring**

For pouring MLC use more liquid than required or add water to make it more liquid.

1. Pour in a small amount of MLC into the mould and brush over the surface of the mould. This will assist in breaking the surface tension of the mould and reduce air bubbles.
2. After the face coat is applied, the remaining mixture can be poured in one corner allowing it to flow.
3. If spillage occurs clean with water before it sets. The MLC turns to "stone" once cured.

A recommendation is to pour mix through a sieve; this will help to prevent lumps to show on the casting. Also one may vibrate or Pressure cast the casting to reduce air bubbles. **DO NOT VACUUM - IT DOES NOT WORK.**

## **Hand Lay Up Technique.**

MLC may be used to make architectural elements - both interior and exterior, planters, panel's film and stage sets, or anything else that one wants to create. With the addition of polycrop woven mesh this will allow MLC to be layed up in thin, lightweight and strong products.

1. Mix up as per instructions above.

Applying a Skin or Gelcoat

2. In order to make up a surface / skin coat add less MLC "A" to the mix, say a 2.7 to 1 ratio (NOTE will accelerate cure). Make up enough to apply to about 2 - 6mm thickness. One can brush apply or even spray on surface coat.
3. Allow skin coat to cure. Mix up another batch, however this time do not add any fillers, thix additives etc.

## **Method**

4. Lay down a thick layer of MLC onto back of skin coat. It has excellent vertical thixo tropic properties
5. Place down MLC polycrop woven mesh on top of layer. Apply another layer of MLC on top of surface of matting. Allow mixture to saturate in glass fibre. Use a **hand** to wet out glass. Ensure no air voids are in the mixture. Each layer of POLMESH is about 1 - 2.5mm
- 6 Continue with the next layer until satisfied with sufficient strength use minimum of 6-10mm (about 3- 6 layers of polycrop woven mesh for the strength & thickness required).
- 7 Reinforcing ribs can be applied after the layup has cured.

**NOTE DO NOT USE STANDARD FIBREGLASS AS THIS WILL CAUSE FAILURE WITHIN 6 MONTHS DUE TO CEMENT ATTACKING THE GLASS FIBRE**

### **Spraying**

For making large products a special Spray machine may be used. For smaller products a GUPPY Gun can be used.

### **Post Finishing**

In order to get a special look of effect one may apply special paint finishes or painting of surface is easy to do use Super Acrylics or PVAs. **MODCON** recommends a good plaster primer and surface must be clean before applying the plaster primer

### **Outside Use**

MLC is designed for outdoor. Therefore no treatment is required

### **Fillers**

Although virtually any mineral filler may be used in MLC, **MODCON** supplies the some special filler for use.

### **Fixing Details**

**MODCON** supplies MLC to the Building industry, however the recommendation of fixing with support brackets, etc is up to the architect and structural Engineer concerned. **MODCON** can advise such professionals or recommend one if necessary



(MODCON is a Trade mark name) 2004/09270

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