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Use of Clear Casting Resin

Water Clear Casting Resin may be used to produce many different items such as door knobs, jewellery, paper weights, plaques, lamp bases, fishing lures and souvenirs as well as the encapsulation of objects such as stones, shells and coins.

Use and Measurement of MEKP Catalyst

Before you start using Clear Casting Resin (CCR), you must first understand that the catalyst (MEKP) which is used to make the CCR harden will NOT remain in the finished article. It will evaporate during the curing cycle. Therefore, if you put in too much MEKP, the CCR will shrink excessively. This may show in your project in a number of ways:

- 1) Large flat blocks may warp and twist. The blocks may also become concave.
- 2) If casting a block in several pours, the later layers may run down around the previous layer where it has shrunk away from the mould.
- 3) Optical problems in the finished article may cause the object in the casting to appear distorted.
- 4) Rapid curing of the resin and excess exothermic heat may discolour the resin or cause it to become hazy. This will often cause discoloration of the embedded object and in extreme cases may destroy it.

The catalyst ratio used is important so, how much MEKP should you use? The catalyst ratio is usually measured as a percentage. With CCR, the percentage used normally ranges between 0.5% and 1.5%, ie. between 5 and 15ml of MEKP per kilogram of CCR. Our standard MEKP information sheet is available, please ask our staff for one if it is not supplied with the product.

Measuring MEKP as a percentage is fine if you are using large quantities of resin and have accurate scales. In most casting applications, relatively small amounts of CCR are mixed so we have to use a method of proportioning which is more practical. Hence we have come up with a chart which relates mls to drops. We have also listed the approximate weights in case you have accurate scales on hand. Keep in mind that the number of drops is based on 1% catalyst and you need to be as accurate as possible.

Resin(gms)	Resin(mls)	MEKP (# of drops)
11.5	10	4
23.0	20	7
34.5	30	10
46.0	40	13
57.5	50	16
69.0	60	19
81.5	70	22
93.0	80	26
104.5	90	29
115.0	100	33

When you cast deep blocks much more heat will build up within the block than when you cast shallow blocks; therefore it is possible to use more catalyst in shallow castings.

Ambient temperature has a lot to do with the amount of catalyst used, more on cold days, less on hot days. It is estimated that a cube cast using 100gms of CCR, 1% MEKP, at an ambient temperature of 25°C will 'gel' in around 18 to 20 minutes. This is a basic measurement around which you can experiment using different catalyst ratios. By recording your results (listing amount of resin, catalyst ratio, ambient temperature and physical size of the casting), you will quickly develop your own technique, but more importantly you will be able to duplicate them at will.

Equipment

- Measuring Weight: Scales that read accurately at 1 gram.
- Measuring Volume: We stock graduated polycarbonate beakers and vials. Also our 60ml MEKP bottles have dropper lids on them. An eyedropper may be used, but this must be dedicated to the task and never used around eyes again. MEKP is extremely dangerous when in contact with the eyes and skin. It is a good idea to keep MEKP droppers in a sealed, suitably labelled jar.
- Mixing cups: Vinyl type plastic cups are suitable for mixing polyester, but most other types ARE NOT. Clean metal cans are ideal as long as they are clean and dry.
- Mixing sticks: Pop sticks or anything else as long as it is clean.
- Cleaning up: Acetone is generally used. This is highly flammable and care should be exercised.
- Pigments: Any polyester pigments are suitable for colouring CCR. They are usually only used sparingly in the last layer (pour) as a background colour.
- Moulds: There are any number of ready to use moulds available which are formed of polyethylene, these require no release barrier. We keep many of these in stock. Many plastic containers may be suitable, but you should experiment to make sure there is no reaction. Most things can be used as a mould, provided it has been carefully prepared using release wax and PVA release agent. We keep these products in stock.

Method

A typical casting of a paper weight using a polyethylene mould:

- 1 Measure the required amount of CCR and MEKP.
- 2 Add MEKP to CCR. Mix methodically, scraping the sides and bottom of the container, rotate the container 90° and repeat. Continue mixing for around 2 minutes. It is important to try and not entrap too many air bubbles.
- 3 Leave to stand for around 5 minutes to allow all bubbles to rise to the surface – break any surface bubbles with a pop stick. Remember to shorten standing time if it is a hot day or you have a large amount of resin mixed.

- 4 Pour the resin slowly into the mould holding the resin cup around 30cm (12") above the mould. This will cause the pouring stream to become very thin and pop any remaining air bubbles.
- 5 Allow to cure until it becomes like hard jelly.
- 6 Mix a second batch of resin as described in steps 1 – 3.
- 7 Take the object you wish to embed in the resin. Make sure it is dry and free of oil.
- 8 Pour some of the second batch of resin into the mould – just sufficient to cover the surface. Using a pair of tweezers, dip the object into the cup of resin and make sure it is coated all over. Place it into the mould in the position you require. Remember that the casting is upside down in the mould.
- 9 Pour the rest of the resin into the mould slowly, being careful not to trap air bubbles around your object. The resin should cover the embedded object by at least 3mm. If the object is thick, you may need to use two layers to completely cover it. Allow each layer to cure to the jelly stage.
- 10 Optional for background colour. Mix another batch of resin as described above. Add a drop of coloured pigment or dye to the resin and mix. Pour the resin into the mould in the manner described above.
- 11 The heat in the first and second layers will cause subsequent layers to cure faster. As soon as the last layer has gone hard the block can be popped out of the mould. Sometimes the back of the last layer, which is exposed to the air, will remain tacky. If this is the case, the addition of 2% styrene wax in the last layer will overcome the problem.

Cutting and polishing

When the block is completely cured (around 7 days), it can be cut and polished if required. This is sometimes necessary if you have used a 'Tupperware' type container. In this case, you may wish to cut and shape the casting to remove ridges and manufacturers marks, which are imprinted on the mould.

- 1 Make the surface flat by sanding with a piece of 80 grit paper on a flat surface.
- 2 Using plenty of water, sand the surfaces using Wet and Dry sand paper. Start with 150 grit then use 220, 320, 400, 500, 600, 800 and 1000 grit paper. After 1000 grit paper, a compound similar to that used for cutting back automotive paint will bring the surfaces up perfectly clear. For those wishing a more perfect finish, the next way is to use 'Micromesh' – this is a cushioned abrasive system going up to 36000 grit!