

TECHNICAL DATA SHEET

PRODUCT: WATER CLEAR POLYESTER CASTING RESIN

SAFETY INFORMATION

THIS PRODUCT IS UNSUITABLE FOR USE BY CHILDREN

- The product has a strong 'styrene' odour and should only be used in a well ventilated workshop, studio or garage.
- Polyester resin is flammable and should be kept away from any sources of ignition.
- MEKP on its own is a strong oxidising agent and should be kept away from combustible materials, especially paper and cardboard.
- Always wear protective gloves and eye protection when handling the liquid resin and catalyst.

For full safety information please read the MSDS datasheet.

DESCRIPTION

Premium quality clear polyester casting resin suitable for clear sculpture casting, object embedding, jewellery making and set design. Its low viscosity makes it suitable for reproducing incredible fine surface detail when casting sculptures and also ensures excellent wet-out when encapsulating/embedding objects in clear resin to make objects such as paperweights.

Features:

- Optically clear
- UV stable
- Polishable to a high gloss
- Low viscosity
- Easily pigmented

USES

The resin is ideal for embedding, rapid prototyping or any type of casting where an ultra clear or coloured translucent part is required. The resin can be used with or without vacuum degassing.

PROPERTIES

Property	Units	Resin	Catalyst	Combined
Material	-	Polyester	MEKP	Polyester
Appearance	-	Yellowish liquid	Clear liquid	Clear liquid
Viscosity @20 °C	mPa.s.	330	9-23	330
Density @20 °C	g/cm ³	1.10 – 1.15	1.00 – 1.16	1.10 – 1.15
Minimum Casting Thickness	mm	-	-	2
Maximum Casting Thickness	mm			75

POT LIFE & CURE

Pot-Life @ 25°C (1% MEKP)	Gel-Time @ 25°C (1% MEKP)	Demould Time @ 25°C (1% MEKP)
10mins	15mins	24-48hrs

CURED PROPERTIES

Hardness	Volumetric Shrinkage	Tensile Strength	Elongation at Break	Flexural Strength	Flexural Modulus	H.D.T
		ISO 527	ISO 527	ISO 178	ISO 178	
	6.5%	60 MPa	1.8%	90 MPa	4000 MPa	72°C

CATALYST RATIO

100 p.b.w. Water Clear Casting Resin
0.3-2% p.b.w. MEKP Catalyst

Resin to catalyst ratios above are listed as parts by weight although parts by volume will effectively yield the same results.

For most castings a mix-ratio of 1% is suitable. This would mean 100g of resin to 1g of catalyst or 100ml of resin to 1ml of catalyst.

For larger castings or in warm conditions the catalyst ratio can be reduced to around 0.5% and in colder conditions or when casting very small parts the ratio can be increased to 2%. Do not over-catalyze the resin; doing so can cause the resin to exotherm (cure too quickly and get hot) which can crack or discolour the resin. If in doubt, use a lower catalyst ratio and be patient whilst the resin cures fully.

For a standard 1% catalyst ratio, use the following mix ratio chart:

Mix Ratio by Weight (Using Scales)		Mix Ratio by Volume (Using Jug/Syringe)	
Casting Resin	Catalyst (MEKP)	Casting Resin	Catalyst (MEKP)
20g	0.2g	20ml	0.2ml
50g	0.5g	50ml	0.5ml
100g	1g	100ml	1ml
150g	1.5g	150ml	1.5ml
200g	2g	200ml	2ml
500g	5g	500ml	5ml
1000g (1kg)	10g	1000ml (1 Litre)	10ml
5000g (5kg)	50g	5000ml (5 Litres)	50ml

Remember that larger castings will get hot during curing and it is essential to use a lower catalyst ratio for larger castings. Very often, larger castings will need to be cast in several batches in order to overcome problems of the resin overheating during its cure.

See important notes in the Pouring & Curing section regarding larger castings.

MOULD PREPARATION

Before use ensure that the master model from which the mould is made has the exact finish that is required in the cast or finished units, i.e. for optimum clarity polish the master model to a very high gloss shine. Ensure that the mould is clean and dry. If the mould is made from metal or resin, use a compatible release agent.

EMBEDMENT PREPARATION

Easy Composites Waterclear Polyester Casting Resin can be used to cast solid clear plastic objects but it can also be used to embed objects within the resin, preserving and presenting the objects. Different types of embedments will behave differently in the resin and so you should experiment with your materials and also familiarise yourself with the following preparation advice:

All Specimens

When embedding an object ensure the object is thoroughly dry. This might mean

gently drying the object in an oven before embedding. This is particularly important if you have recently washed the specimen.

Plastic Objects

Be careful when attempting to embed plastic objects as many everyday plastics will be affected by liquid polyester resin and may discolour, deform or even dissolve to some extent. Conduct some tests in uncatalysed polyester resin to see whether the material is suitable. If the plastic is affected by the polyester resin and you do really want to embed it then consider an alternative clear casting resin such as our Waterclear Polyurethane Casting Resin.

Stones, Shells, Metallic Objects

Any mineral based materials like shells, coins and stones need only to be thoroughly washed and dried before they can be embedded. Difficult to remove dirt and grease can be removed using acetone. To reduce the likelihood of any small air bubbles or reaction occurring on the surface of the objects when they are embedded you can dip them in some uncatalysed casting resin the day before you use them and then leave the resin to drain off before embedding them the following day.

Flowers, leaves etc

Flora such as plants, flowers and leaves need to be thoroughly dried before embedding. Be aware that the drying process will have an effect on the colour of the specimens however this cannot be avoided. Failure to dry the specimens will affect the appearance of the surrounding resin (causing misting or bubbles) and will also cause the specimen to decay or deteriorate over time.

Specimens can be dried by burying them in a container of silica gel crystals, fine dry silver sand, using a food dehydrator or by placing them in a fan assisted oven at a low temperature for several hours. Once dried, specimens should be sealed using hair-spray.

Insect Specimens

Biological specimens like insects etc. often contain natural oils and contaminants which need to be removed before embedding. The easiest way to do this is to repeatedly dip the specimens in acetone. Although nail varnish remover is predominantly acetone it also contains water and waxes (like paraffin wax) to act as a moisturizers and so should not be used. Remember that acetone is a strong solvent and highly flammable.

Paper, Photos, Magazine Cuttings etc.

When liquid resin comes into contact with paper materials such as photographs, magazine cuttings, comic strips or artwork it is very likely that the resin will soak into the paper making it translucent and spoiling the appearance. To prevent this from happening paper objects should be thoroughly sealed using PVA glue. Apply the PVA completely over the front of all paper objects, allow it to dry fully (where it will become clear) and then turn the objects over and apply PVA to the reverse. Only once both sides have fully dried can the paper objects be embedded.

Supporting Objects

Very thin Perspex rods are useful for holding the units in place this will eliminate the need for casting in layers and so avoid join lines.

Alternatively, you can pour a first layer to act as a 'shelf', allow it to cure, place your object on top of the first pour (the shelf) and then pour the remainder of the resin around the object to be embedded. When doing this it is likely that a faint witness line will be visible between the two pours.

USING PIGMENTS

If using pigments, add the pigment to the resin before adding the catalyst. We suggest using 1 – 3% pigment. Only use pigments designed for pigmenting polyester resins.

You can create interesting and artistic results by pouring your casting in multiple layers, allowing the previous layer to cure and then adding different colours or pigment ratios to subsequent layers.

Other interesting resins can be created by pigmenting two or more batches of resin and then carefully pouring them at the same time to create marbled colour effects.

MIXING INSTRUCTIONS

Ensure that both the resin and the catalyst are between 20 – 25°C before mixing. Mix the resin in a clean plastic mixing cup (or sealed paper mixing cup).

Mix the resin and catalyst in the correct ratio (see the mixing ratio section above), mixing carefully to avoid air inclusion and making sure that the material at the sides and at the bottom of the mix vessel is well stirred in to the middle. Spend quite a few minutes ensuring you have thoroughly mixed the catalyst into the resin.

POURING & CURING

Pouring

Easy Composites' Water Clear Polyester Casting Resin can be used without the assistance of vacuum degassing yet still achieve bubble-free casting.

To reduce air bubbles pour the material into a low point in the mould in one place and allow it to fill up around any embedments you may have. Don't pour it directly onto your embedments.

If you are pouring in multiple layers then additional pours of resin can be made as soon as the first pour has cured sufficiently as to feel firm. A tackiness on the surface of each pour is perfectly normal and will help subsequent pours to cross-link properly, ensuring a good bond between layers.

Avoiding Tackiness on the Surface of Cured Resin

When Waterclear Polyester Casting Resin cures in contact with air (i.e. the surface of a pour) it will always remain tacky even after the main casting has fully cured. To overcome this, for the last layer, or if casting is completed in just one pour, a layer of cellophane or release film should be placed directly on top of the surface of the wet resin so that it is not in contact with air as it cures. If you do this, once the resin has cured you can remove the cellophane and the resin on the surface underneath will be glossy and fully cured.

Full Cure

Allow the casting to cure for at least 48 hours before machining or polishing. To avoid distortion ensure that the material does not reach temperatures above 72°C during machining or polishing.

If after 48hrs the resin does not feel fully cured then put the casting somewhere as warm as possible to try to finish the cure. If this has happened you would want to increase your catalyst ratio next time and/or work in warmer conditions.

STORAGE

Both the casting resin and catalyst should be stored in their original, unopened containers between 20 and 25°C. Polyester solutions contain volatile and flammable monomers such as styrene and should be handled and used in a well ventilated, flame proof area.

KEEP THE PACKING TIGHTLY SEALED WHEN NOT IN USE.

SHELF LIFE

If stored under the above conditions the resin and hardener will have a shelf life of 4 months, from the date of production.

This data is not to be used for specifications. Values listed are for typical properties and should not be considered minimum or maximum.

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Before using any of our products, users should familiarise themselves with the relevant Technical and MSDS provided by Easy Composites Ltd.

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