



“How to” Facts

**Casting with
Polyester Resins**

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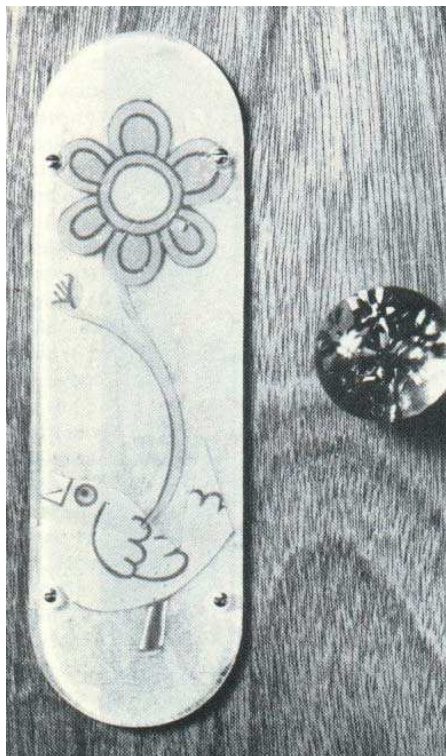
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Clear plastic, i.e. Polyester Resin, is the newest and most exciting craft material to have appeared for many years. It is a very adaptable substance with which to manufacture a wide range of objects, from useful articles for the home, to jewelry and ornaments or mementoes embeded inside crystal-clear resin.

The raw materials and equipment needed are not expensive. Polyester resin is easy to use once the few basic rules of the craft are mastered and no special workroom or complicated machinery is needed.

This brochure shows some of the things which can be made with this material.

WHAT IS CLEAR PLASTIC?



It is liquid polyester resin, a treacly substance which, when mixed with a special hardener or catalyst, and left to set for a few hours, becomes extremely hard.

There are many different types of resin. The easiest one for the beginner is the crystal-clear resin in which things can be embedded so they look as though they are set in glass. Resins can also be mixed with other substances, have pigments added to them, be thickened or used with fabric, glass fibre, etc, depending on what is required. But however it is used, and whatever it is used with, once the catalyst has been added to the resin, and it has set, it has set forever.

Hardened resin can be sawn and sandpapered into shape.

Useful as well as decorative things can be made with clear plastic. This doorknob is made of beads and sequins set inside clear resin, and the fingerplate is a collage of paper, set inside clear resin and reinforced with glass fibre for added strength. The knob was moulded in remeltable rubber before being reproduced in resin while the fingerplate was moulded in a cheap tin fingerplate, suitably waxed and treated so that it would release after setting.

WHAT YOU NEED TO WORK IN CLEAR PLASTIC

Resins

These are usually sold by weight in cans or in thick, light-proof plastic containers with a "life" of about six months. The containers should be kept in a cool place. Because it is a flammable product, it must not be used near a naked flame.

Most craft kits sold in hobby shops contain the very clear embedding resin. It is also possible to obtain thicker resins for laminating and moulding work, and a thixotropic paste resin which will stay in place on a vertical surface without dripping off. It can be added to ordinary resin to stop it flowing uncontrollably, but it will make clear resin opaque. Its main use is in 'gelcoats', that is, the first coat applied to a mould, when working with glass fibre. Laminating and moulding resins do not usually harden crystal clear, but tend to have a pinkish tinge which can affect very delicate colours. Therefore if delicate colours are wanted, it is best to use them with clear embedding resin.

Resin can also be bought with an anti-cracking additive, one that leaves a tacky surface, a heat and chemical resistant one, and many others.

Resin is very sticky, and has a strong, but not unpleasant, smell. It is quite safe to use as long as the simple safety precautions listed below are observed.

Catalyst

Resin has to have catalyst added to it before it can harden. Once the catalyst has been added to the resin, hardening (sometimes called 'curing') begins, taking about half an hour before it begins to gel. The stages of setting are: liquid, jelly, soft rubbery consistency, very hard.

Therefore work must be done quickly once the catalyst has been added. It is important to prepare everything beforehand, laying out all tools and materials. It is also advisable not to mix up too much catalysed resin at once, otherwise it may be wasted.

The amount of catalyst to be added to the resin varies from 1% to 2%, depending on the temperature of the room, whether colour or other fillers are used, and how fast the cure is to be. The manufacturers of the resin and catalyst always advise how many drops of catalyst to use per pound of resin, and most manufacturers also provide a catalyst bottle with a dropper lid.

Curing is dependent on two factors:

1. The temperature of the room. Normal room temperature is taken as 20°C. The colder the room, the longer the resin will take to set.
2. The thickness of the casting. For greater thicknesses the hardener must be reduced, and it therefore follows that for thinner castings, the hardener should be increased.

Using a 5ml medicine spoon, or a measuring cup or beaker calibrated in mls, it is useful to know that 5mls of hardener is equal to about 1% of .45kg of resin; 10mls of hardener is equal to about 2% of .45kg of resin.

Resin cures by heat, so if the temperature of the room is high, a little less hardener will be needed than if the room was cold. Catalysed resin in bulk will set more quickly than catalysed resin spread thinly over a large surface.

Too much catalyst added to resin causes it to crack when it cures. Too little catalyst, and the resin will remain tacky.

Moulds

As polyester resin is a liquid until the catalyst is added to it causing it to cure, it has to be contained until it hardens. This means that a mould of some kind will always be needed.

Moulds can be purchased from Norski directly, (consult the website for examples) craft shops, household utensils can be used, or you can improvise. Spoons, ashtrays, dishes, waxed milk cartons, egg cups, foil trays, acetate box tops, detergent containers, can all serve as moulds. Pottery, Pyrex, polyurethane, glass, metal, epoxy resin or silicone rubber, are all suitable mould materials.

When pouring resin onto a flat surface, an excellent container can be made by sticking masking tape round the edge of a waxed board, or by building a low bank of modelling clay round the edge of a piece of acetate.

When using a kitchen utensil or an improvised mould, remember:

1. The shape must be such that the article will come out easily when it has solidified – there must be no undercuts or awkward bumps or curves.
2. The mould should have a smooth, shiny surface if possible, to help with the removal process, and to impart a high gloss to the finished product.

3. Do not use a mould made of Polystyrene, as the resin will dissolve it. Test a doubtful mould beforehand by putting a little resin on it and waiting to see what happens.
4. Moulds must be firm enough to support the weight of the liquid.
5. Moulds must be able to withstand a considerable amount of heat during curing. Some plastic containers buckle under heat.

Personalised moulds can be made by using plaster of paris, or 'remeltable rubber'. This is heated until liquid, then poured over the object to be moulded. When it has set, the rubber can be peeled off the object, leaving a perfect impression into which resin can be poured.

Release Agents

Resins bond extremely well to most surfaces, so in spite of the fact that they shrink when cured, it is important to treat the surfaces of all moulds except remeltable rubber, with a release agent, before pouring in the resin.

Wax is one of the best of all release agents. Polish the surface of the mould twice with non-silicone wax, until there is a high shine, then, with a sponge, add a thin film of PVA water-soluble release agent. Do not leave any ridges of wax or the resin will reproduce their impression. Once the release agent has been applied to the mould, do not touch it, or the protective film will be broken.

If you have an awkwardly shaped mould, run hot candle-wax evenly round the inside before pouring in the resin, to ensure an easy release. Cellophane, acetate, and waxed paper are all good release materials.

Glass Fibre Chopped Strand Mat

When reinforced with glass fibre, resin is strong, flexible and weatherproof, whereas by itself, unless it is in block form, it will break easily. When making mats, trays, lampshades, panels or anything with a flat exposed surface, therefore, it is best to reinforce the polyester resin with glass fibre. Glass Fibre mat comes in various weights and widths, and can be cut with scissors.

It is stippled with a brush loaded with resin, until the mat becomes impregnated with it, when its white surface gradually changes appearance until it is almost transparent. When dry, the glass fibre gives the hard resin a slightly milky appearance.

A very fine glass fibre mat is best for finished surfaces, and for translucent panels.

Colours

Pigments for use with resin come in many types. They can be transparent, opaque and also metallic, pearly and luminous. It is not advisable to use colours other than those specifically made for use with resins (see section on colours). **Norski have a range of pigments that are guaranteed to work, why not use ours?**

Cleaner

Brushes and tools become rock hard if they are not cleaned immediately after use, so it is important to have in a good supply of cleaner. This is bought in craft shops as resin solvent, but acetone will also clean off resin. To clean brushes, wash them in solvent, wipe on rags or paper, then wash in detergent and hot water. Don't use wet brushes for further work, but wait until they are dry. Water can inhibit cure.

Never pour resin solvent that has been used for cleaning brushes down the sink. Resin solvent has toxic fumes and should not be used in unventilated or confined space. It is also flammable and must be used away from naked flames. Do not use resin solvent on hands. Instead use a cleansing cream or wash hands well in soap and water.

Barrier cream

This will protect sensitive skin, though many people prefer to wear rubber gloves.

Calibrating cups and measuring beakers

These are invaluable for mixing resin, as they are measured off in ounces or mls. (Use glass or polythene mixing containers for embedding, as resin may pick up fluff which will show in the clear block.) **Norski offer a 'Measuring Kit' (which has everything you need in it) Buy direct or through Mitre 10 or Bunnings.**

Other useful equipment

A roll of cellophane for making mats and impregnating fabrics with resin. It is also recommended as a working surface. Newspaper quickly sticks to the work in hand, often ruining it, while cellophane (or acetate or waxed paper) can be peeled off cured resin easily.

- Wooden or paper sticks for mixing resins.
- Cocktail sticks for delicate work, enamelling and jewellery.
- Rags for cleaning brushes and hands.
- Roll of kitchen paper, for cleaning.
- Masking tape, for making containers to hold resin.

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- Modelling clay for the same purpose.
- Brushes, for stippling resin onto glass fibre.
- Foil cups, for mixing colours.
- Plain waxed paper cups, useful for pouring.
- An electric drill with sanding and buffing attachment, for finishing work.
- Wet and dry sandpaper and metal polish for finishing.
- Small hand drill for boring holes in jewellery castings.

Safety precautions

1. *Always follow the manufacturer's instructions implicitly.*
2. Sensitive skin may be irritated by resin, so a good barrier cream or protective gloves are advisable. Don't use resin solvent to clean hands; clean instead with cleansing cream.
3. Catalysts may irritate the skin, so take care not to splash or spill them. If some is dropped on the skin, wash off at once. If catalyst should splash in the eyes, wash them immediately with clean water for 15 minutes, and then do not fail to consult a doctor.
4. Using small amounts of resin for craft work is not likely to cause vapour irritation, but work in a well-ventilated but warm room if possible.
5. Catalyst and accelerator must never be mixed together. Store as far apart as possible.
6. Resin cleaner is flammable. Keep away from naked flame.
7. Do not pour resin down a drain.
8. Use goggles to protect the eyes when polishing and sanding with a high speed drill. Use a face mask to protect lungs from dust when sanding with a high speed drill.

How to embed objects in clear resin

You will need:

- An object to embed
- Clear resin
- Catalyst
- Transparent colour (if used)
- Measuring beaker
- Mould
- Release agent



A small boat, captured inside a block of clear resin.

Once the object to be embedded in resin is chosen, make sure it is clean and dry. Water will cloud the resin. Find a suitable mould (see previous section on moulds) and clean and dry it. Wipe it with mould release wax (usually

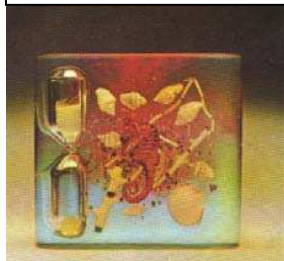
supplied with a kit, but if not, use a non-silicone wax). Norski mould release wax is perfect here, call for where to get some in your area.

Allow wax to dry, then polish with a soft cloth. Do this twice, making sure that no excess wax is left in the corners to ruin the final moulding. To be quite safe, add a film of PVA water soluble release agent, spreading it on thinly but evenly. Do not use a PVA release agent unless you have finishing and polishing equipment.

Pour the quantity of liquid resin needed into a measuring cup.. If a tint is wanted, add a little transparent colour, just enough to tint the resin.



Sea subjects lend themselves particularly well to the embedding treatment, giving an attractive underwater effect.



Mix well, but gently, avoiding bubbles, then add catalyst, again mixing well so that it is evenly dispersed throughout the resin.

Follow the manufacturer's instructions as to the correct amount of catalyst to use. The thicker the casting, the less catalyst will be needed. Resin spread thinly over a large surface will need more catalyst.

Make up only as much resin and hardener as needed, to prevent waste. A good way to find out how much is needed is to fill the mould with water beforehand, measure it and then substitute the same amount of resin. Be sure to dry and prepare the mould before starting.

Embedments are usually in three layers:

1. The foundation for the object
2. This contains the object
3. The backing – often opaque and coloured.

Pour a thin layer of the catalysed resin into the mould – enough to cover the bottom. Place the mould in a warm place on a level surface, cover it to prevent dust falling on it, and leave it to set until the plastic will not move when the mould is tilted (about 3 or 4 hours).

Make sure the object to be embedded is dry. If necessary dry it in the oven, or on a radiator, as water will make the resin hazy.

Place the object on top of the first layer of resin, facing downwards. Prepare more catalyst and resin and stir thoroughly. If the object to be embedded is very elaborate, saturate it in catalysed resin beforehand to prevent air bubbles. Slowly pour the second layer of liquid until the object is completely

covered. If it has a flat surface and is facing downward, move it about under the liquid to ensure that no air is trapped. If it is likely to float, pour a little catalysed resin over it, and allow it to set before covering it with the next layer of resin.

For an interesting, 'exploded' effect, as when embedding, for example, the inside of a watch, pour on several thin layers of resin, placing objects on each layer to give depth to the finished product.

Finish with another layer of resin and hardener, adding a little colour pigment, opaque or translucent, if desired to give it a base. But make sure when pouring on the last layer of colour onto clear resin, that the first two layers of clear resin have not shrunk. This happens sometimes, leaving a small gap all round the sides, into which coloured resin will seep. If there is a gap round the edge, remove the shrunk casting, pour a little clear catalysed resin into the mould, and re-set the clear casting into it. When the new resin has set, add the coloured resin.

To remove from mould, completely immerse the mould in boiling water for ten minutes, then transfer and immerse the mould upside down in very cold water for ten minutes. Repeat this until the casting drops out of the mould. Don't chip away at the casting in the mould trying to get it out. It is not necessary and will spoil it.

Resin hardens most satisfactorily on surfaces which are not in contact with the air, so it is a good idea to cover exposed surfaces with a sheet of waxed glass or a piece of cellophane paper, while setting.

After the hardened resin has been removed from the mould, it should be allowed to cure further by leaving it as long as possible at room temperature before final polishing.

Finishing a casting

Some manufacturers produce resins that need little or no polishing. A glass or ceramic mould ensures a smooth surface which needs no finishing, apart from smoothing the back. Most other moulds leave a surface which will need a final polish. If final polishing is necessary, an electric drill with a sanding attachment will save time.

When sanding hardened resin, it is best to use a face mask, as the dust is unpleasant to breathe. Goggles will protect the eyes from possible flying chips of resin. Wrap up well against the dust. When a straight edge is to be sanded level, draw a guide line in pencil, and sand to that line.

Use coarse sandpaper, or a non-clogging sanding disc, at first (keep fingers well out of the way of the wheel), then go on to a smoother sandpaper, to 'wet and dry' sandpaper, then use a buffing wheel, and finally, polish with a soft cloth and metal polish. (Nickel Chrome cleaner is excellent.)

On complicated pieces of work, it is not always possible to use a sanding machine, but a high gloss is still possible by coating the surface with a clear varnish, or a coat of clear, heavily catalysed resin.

If the surface remains tacky, wash with strong detergent or acetone then sand smooth and buff with metal polish.

As a short cut, a piece of felt can be cut to fit the base and stuck over the tacky area.

Large castings

When making a large casting, it is advisable to pour no more than a quarter of an inch at a time. Otherwise the heat engendered by the curing will be so great that the resin will crack.

To reduce heat and prevent cracking in large castings, the mould can be placed in cold water (but keep water from the resin surface). If larger castings are planned, reduce the amount of catalyst.

Using resin with glass fibre

Glass fibre is used with resin to add strength and resilience.

A coat of resin is painted onto the surface of the mould, then a piece of glass fibre is laid on top of the resin, then more resin is stippled on with a brush until the glass fibre mat is soaked with it. It is important to stipple the resin and glass fibre, rather than try to paint it, as a painting motion will produce a lumpy surface. Stippling also helps to work out air bubbles.

When the glass fibre has absorbed the resin, its appearance will change from white to almost transparent.

Fabric, paper or any other suitable material is laid on top of the glass fibre and impregnated with resin to make decorative trays, lampshades, tablemats and waste bins.

How To Make A Glass Fibre Reinforced Resin Tray

Materials:

- General purpose laminating resin (clear embedding resin can be used but is not so suitable for use with glass fibre)
- Thixotropic paste resin, for the 'gelcoat'
- Catalyst
- Brush
- Tray, to use as a mould
- Fabric, cut slightly larger than the tray
- Glass fibre, also cut slightly larger than the tray
- Glass fibre surface tissue, cut slightly larger than the tray
- Scissors
- Wax and PVA release agent
- Pigment, for 'gelcoat' of tray.

Any smooth-surfaced tray will serve as a mould, and as long as a release agent is used, the glass fibre duplicate will come away easily without damaging the original.

Wax polish the tray being used as a mould until it has a good shine. The tray must be polished clean or the resin will pick up the wax detail. Sponge on a coat of liquid PVA release agent, and leave to dry.

Either make the tray inside the mould, or outside. The following describes how to make a tray using the inside of the mould.

1. The first coat of resin to go on the tray is known as the gelcoat and it will be the base for the laminate.
2. Add a little thixotropic paste resin to the resin you are using, to help it thicken and to adhere to the sloping sides of the tray. A simple gelcoat has something like 15% thixotropic paste in it.
3. When mixing thixotropic paste with resin, measure out the right quantity of each, then mix together equal quantities of thixotropic and ordinary resin until they are properly blended. Finally, add the rest of the ordinary resin. This will prevent lumps.
4. It is also a good idea to add pigment to the gelcoat. It provides a more attractive backing to the tray, and you can see if it is going on evenly.

5. Brush the gelcoat on evenly, watching for holes which may occur on the waxy surface if it is applied too thinly.
6. When the gelcoat has dried, cut two sheets of glass fibre and one sheet of glass fibre surface tissue, all slightly larger than the tray. Mix up some clear catalysed resin, and put it on the gelcoated surface of the tray. Place a layer of glass fibre mat on it, and stipple more clear catalysed resin into it. Do the same with the second layer of glass fibre, and finish with a final layer of fine surface glass fibre tissue (placed fluffy side down if it has a fluffy side) to give a smooth final surface.
7. When the glass fibre has set, the new tray can be removed from the mould, and the final layer of fabric, impregnated with resin, added. The surface fabric will become much darker when it has been impregnated with resin, so choose a light one, with a clear pattern. Iron fabric before using it. Stretch materials will follow the contours of a tray, but ordinary fabric can be clipped at the corners so that it fits into the shape of the tray, cut edges overlapping so they don't show. If some sort of shaping is not done, bumps may occur in unexpected places when the resin hardens due to air bubbles and pleats. When impregnating the fabric with resin, make sure all air bubbles are worked out with the brush.
8. For a shiny surfaced tray, put a layer of clear resin on the outside of the mould tray, then a layer of impregnated fabric (face down), then two layers of glass fibre, but watch for air bubbles which are much more likely to appear when moulding this way up.

Finishing

Edges can be trimmed with a sharp knife while the tray is still on the mould before the glass fibre has hardened, but after the resin has gelled. If it is left until it is completely hard, it will have to be trimmed with a hacksaw and sanded.

To Make A Lampshade

Materials:

- General purpose resin
- Catalyst
- Brush
- Polythene bucket (as a mould)
- Fabric the size of the finished shade
- Glass fibre the size of the finished shade
- Release agent.

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Use the same method as for the tray, but mould round the bucket. Use clear resin throughout and only one layer of glass fibre. Lace the fabric on top of the layer of glass fibre, and soak it with catalysed resin. When set, trim top and bottom. Finish with lampshade trimming and fit a shade suspension ring.

Table Mats & Coasters

Materials:

- General purpose resin
- Brush
- Cellophane paper
- Catalyst
- Fabric or paper, cut to the shape of mats or coasters.

Lay the sheet of cellophane paper on the table, and cut out the fabric or paper to the size required. Cut a matching piece of glass fibre. Mix the required amount of resin and hardener, and brush a layer onto the cellophane sheet. Place the fabric or paper mat into this resin, add more resin on the mat, and into that, place the piece of glass fibre mat. Add more resin and stipple until the mat, the fabric or paper are all impregnated with resin.

Now place another sheet of cellophane on top of the impregnated mat, and with a piece of wood, smooth the mat over and over again until all the air bubbles have disappeared. This is very important, as if air bubbles are left in, they will appear like 'pock' marks on the surface of the hardened mat.

Turn the mat, still in its cellophane parcel, and smooth over the reverse side as well.

Leave on a level surface to harden, then remove the cellophane sheets.

Edges of hardened resin, if not too thick, can be cut with scissors.

Waste Bin

A waste bin can be made by the same method as table mats and coasters. Make five panels the same size. When they have hardened fasten them together with thickened resin.

USING COLOUR

Transparent colours give clear, jewel-like effects, which when set into the resin and held up to the light, glow like stained glass. With opaque colours, subtle shades can be achieved by mixing, or the colours can be used direct

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from the pot. Metallic, pearling and luminous colours are also obtainable, giving an effective finish to some types of work.

Colours are mixed in the resin carefully to prevent the formation of bubbles. Only small amounts are necessary, from 2½ to 10%, depending on strength of colour required. Too little pigment will result in a thin colour, too much will prevent the resin curing. Different colours will affect the curing time of the resin slightly, and in varying degrees which will be discovered with experiment.

After the colour has been mixed into the resin, the catalyst is added in the usual way, and the mixture is then ready for use.

When working on a small scale, mix colours and resins separately in foil cups and catalyse each colour only as it is used to prevent colours hardening before they are used.

Another way to prevent waste is to pour left over coloured resin into a plastic ice-cube container to harden. When there are enough little coloured cubes, they can be used to make a mosaic panel. Don't mix colours in a measuring beaker; it will ruin it.

Some Ways of Using Colour

One way to get the feel of working with colour is to use an opaque shade for the final backing layer of a piece of embedding – a brooch, for example, when it will hide the pin. Make sure when using colour on top of clear resin, that the resin has set completely, or the colour will bleed into it. Transparent colour, used sparingly, will tint clear embedding resin.

Cold Enamelling

Cold enamel is one of the most interesting ways of using colour with resin.

Colourful hard surfaces can be produced by this technique, on a base of glass, metal or china, or indeed on any surface. Things made by this method take longer to set hard than embedded objects or the glass fibre technique, often as long as a week.

Cover a square of cardboard (with a small piece of glass fibre set at the back to prevent it warping) with thick catalysed resin in one colour. Drop very small amounts of two or three colours into it. The colours will slowly develop and set into a pattern by themselves. Don't use more than two or three colours on a small surface.

Using this enamelling technique, you can also:

1. Drop two or three pools of colour onto a base, and mix them by drawing a matchstick through them.
2. Allow a basic colour to harden, then drop colour onto it, to give a sharper definition.
3. Allow drops of colour to harden on waxed paper or cellophane. Later, press them into unset pools of colour for a raised effect.
4. Add glass beads or sequins to the resin surface before it goes hard.
5. Put transparent colour on metal foil sheet, so that the silvery colour shows through.
6. Bend copper wire into a pattern, and stick it to a base with clear resin. Pour different colours into the fields created. Each field will retain its separate colour – as in cloisonné enamel.



A sparkling array of cold enamelled jewellery. Buttons, squares of plastic, scraps of tiling, can all form bases for items of jewellery. Pins and fastenings can be stuck on with epoxy resin.

Marbling

For a marble effect, first choose two or three suitable, marble like colours. Two or three shades of green on white, or grey and white, would look convincing. Place each colour to be used, with resin, in separate containers, and then add catalyst to each one and mix. Pour all the colours into one large container, swirl them slightly then pour the mixture onto the surface to be covered, tilting and swirling to control the flow. A brush is not used at all.

Transparent colours, swirled onto a opaque base, give an interesting variation.

An attractive table top can be made by this method. A table top measuring about 30.48cm (12") x 45.72cm (18") would take about .91kg (2lb) of resin, giving about .635cm (¼") thickness of 'marble' on a piece of block board. Masking tape will contain the resin on the board until it is set.

If in doubt about how much resin is needed for an area, measure first with water, dry off and then replace the water with resin.

Stained Glass Effects

Stained glass effects can be made with transparent colours, using cellophane paper or acetate.

Plan a design on paper and place it under cellophane. Place a piece of glass fibre surface tissue on cellophane and impregnate it with catalysed resin. Lay black cord or braid on the wet resin, according to the design on the paper, making sure there are no cracks between the cord and the surface tissue. Put a cord border all the way round the design and allow it to harden.

Each field is then filled with transparent coloured resin. Watch for cracks in the walls between each section and if you see any, stop them up with modelling clay to prevent the colours bleeding into each other.

A Flat Relief Panel

Prepare a board to hold the resin by putting some masking tape round the edges and sticking it down securely. Melt some paraffin wax (ie. candlewax) and pour it into the tray until the surface is evenly covered. If you use dark coloured wax, the design can be seen better, but some colour might transfer itself to the panel. Carve a design in the wax with a lino cutter. It is important to carve a border all the way round the design, and to plan the design so that every line ends up against another line, making little self-contained areas which will later hold resin.

Pour catalysed, uncoloured, clear resin onto the wax and work it well into the etched design.

Lay a mat of thin glass fibre in it (thin glass fibre will allow more light to get through), and stipple with a clean brush. Cover with a sheet of cellophane or waxed paper and push out all the air bubbles. If all the air bubbles are not removed, it doesn't matter because they can look attractive when seen against the light, amongst all the colour.

When it is hard, remove the resin mat, which will now have a carved design raised on it in hardened resin. Each field of the design can then be filled with transparent colour. Fill non-adjacent fields and let them set first, rather than filling all at once, as colours have a tendency to overflow their banks and bleed into each other.

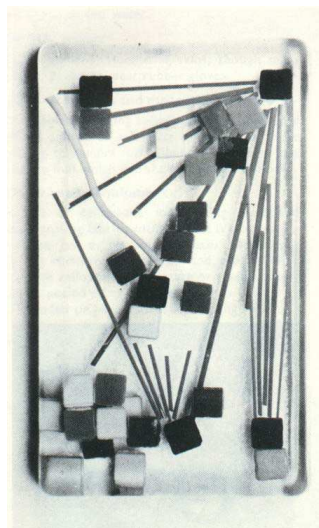
Text Box: A layer of clear catalysed resin is poured onto a waxed board, surrounded with masking tape. When this is hard, another layer of clear resin is poured onto the board, into which is laid a pleasing design in coloured acetate. More resin is added, and a sheet of thin glass fibre laid into that to give the panel added strength.

Jewellery

once the techniques described in this brochure have been mastered, beautiful pieces of jewellery can be made. Copy existing pieces of jewellery by moulding them in re-meltable rubber. Cast them in a metal finish colour. Embed sequins and artificial stones to make key rings and finger rings. Experiment with several techniques together.

Fastenings, obtainable from craft shops, can be set in the resin at the final stage, or stuck on afterwards with a blob of clear, catalysed resin, or with adhesive.

Holes can easily be bored in hardened resin with a small hand drill. Then gold jump links can be inserted, enabling several embedded or enamelled pieces to be joined together to make a necklace or a chain belt. Drilling is made easier, on slippery surfaces, by covering the surfaces with transparent sticky tape before starting.



A brooch, easily made by embedding small mosaic squares and plastic rods in an abstract design, inside clear plastic. This would look effective in tinted resin.

TROUBLE CHART

Resin doesn't gel

Catalyst may not have been added. Or possibly the resin or the hardener are old and time-expired (over 12 months).

Tacky surfaces

Air has inhibited the curing, or perhaps not enough catalyst was added. Seal off the air with a layer of cellophane while curing. Or, wash surface with acetone, then buff and polish. Or, re-coat with a heavily catalysed resin.

Casting sticks in the mould

Insufficient care has been given to putting release agent into mould. If possible, place the casting in boiling water for ten minutes, then place in cold water. Do this twice. Change of temperature will cause the resin to shrink, and it will then come out of the mould. If the worst comes to the worst, the mould may have to be destroyed.

Cracks in the hardened resin

Too much catalyst, or use of embedded objects with a different expansion and contraction rate to the resin (glass chunks will cause cracking if embedded). Use less catalyst, or cool the mould in water during the cure, but wrap up the embedment in foil or other waterproof material, to protect from moisture.

Cloudy casting

Caused by water or moisture in the work. Embedded objects must be absolutely dry. Work in a damp-free atmosphere.

Bubbles

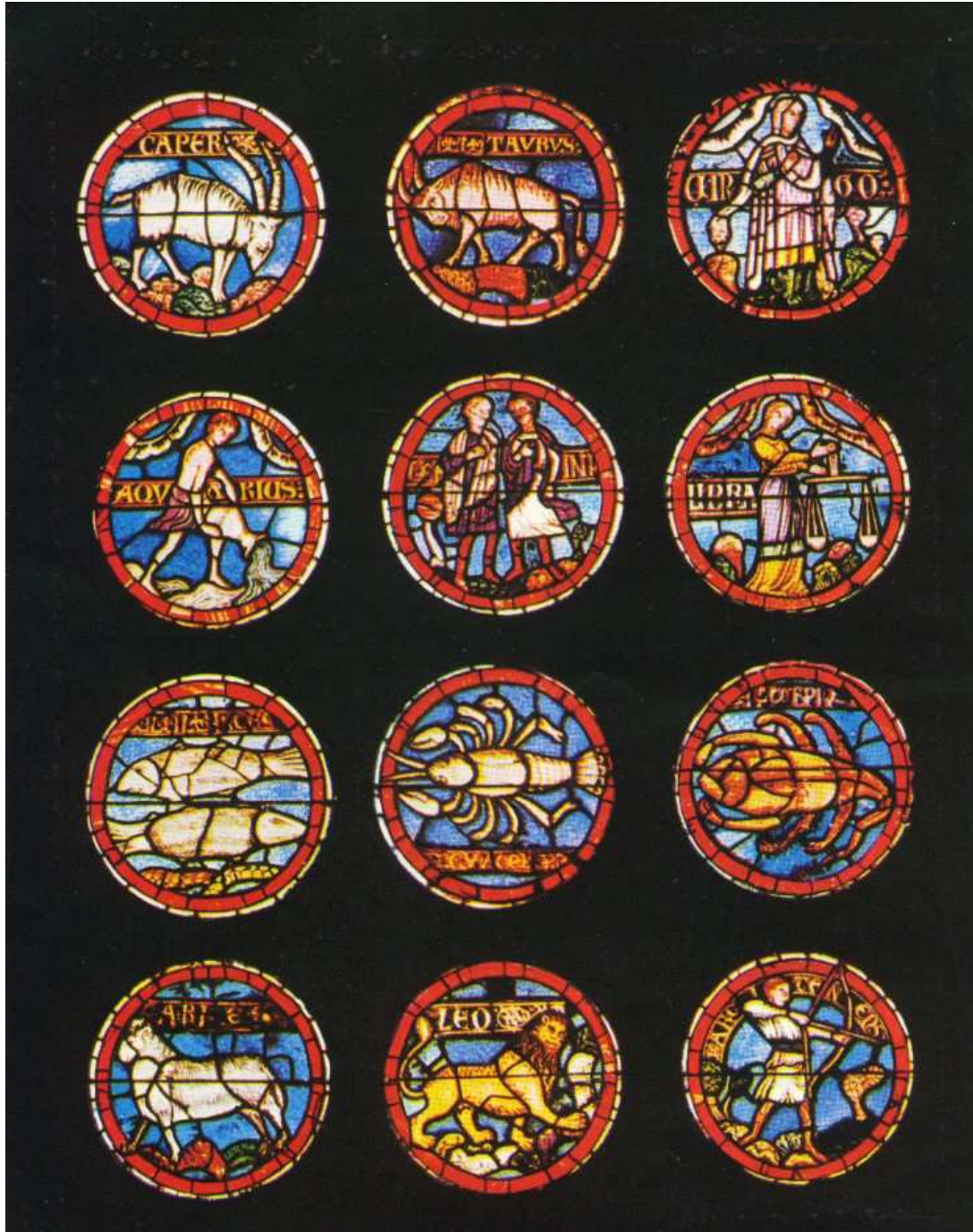
Caused by air trapped in resin. Mix resin carefully. Remove bubbles before hardening with a toothpick or needle. Move embedded objects round to make sure no air is trapped. Soak objects beforehand in catalysed resin.

Warping

This can happen in thin areas, and is usually due to uneven application of resin. Put resin on both sides of a panel. Keep areas of resin the same thickness.



A 'stained glass' picture looks best held against the light. See page 17 for instructions on how to make glass fibre reinforced panels.



Colour transparencies can be turned into 'stained glass windows' which look attractive when placed against the light. Use the technique for making table mats (page 13) with thin glass fibre backing.



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