

DISPRO LENS FABRICATION

Originally Dispro lenses were made of glass. The moulds and colour formula are no longer available. The following is a method developed to make a small number of replacement lenses for Dispro lights out of plastic. The process can be used for most replacement lenses required for marine running lights.

Material

The starting material is clear polyester casting resin available from "Smithcraft" in Toronto. It is the clear plastic trinkets or silver dollars are often seen displayed in. The colouring (red and green) is metallic based Azon dye stuff with a high solubility in methyl acetate. The colours should be the deepest available in the colours required. The darkness or depth of colour cannot be changed by mixing colour (ie with black). The only parameter available to adjust the colour is the dye concentration.

Getting the Colour

The dye comes in a powder form. A solution of dye is made by mixing dye powder with acetone. Acetone is the solvent for polyester casting resin. The dye solution is then mixed with a batch of resin to get the desired colour. Since a small quantity is required, an eye dropper was found to be useful.

The colour of the batch does not give the final colour of the lens. This is because lens colour and transparency depend on the thickness of the material. To get the right colour is a matter of experimentation. In order to reproduce a certain colour, once a good one is found, 1/4" samples of the resin in clear pill bottles is a good way to record the batch colour. This allows duplicating the colour at some future time by comparing a 1/4" thick sample from the batch to the sample which gave a good colour. Is this a quality control program or what!

The batches appear very dark for the resultant lens colour. It is interesting to note that the Dispro light and the pedestal lights have different dye concentrations even though they were from the same era.

It should be noted that colour after lens fabrication is extremely sensitive to lens thickness. If the colour is too light, additional thickness may be built up.

Dispro Lens

The eye-like Dispro lenses are machined to shape on a conventional wood lathe using wood working tool. First, a mould of coloured resin approximately 1-1/2" x 3" x 1/2" is poured. It hardens in a few hours but does not fully cure for a number of days. It is best to wait until the mould is fully cured. The lens is then machined to size using an original lens for size and dimensions. It is necessary to turn the lens over to machine the back side. The result is a dull, dark, almost colourless piece of plastic the shape of a Dispro lens.

The lens is then given a quick wipe of acetone to clean the surface. Mix up a small batch of the correct colour and paint it on both sides of the lens. It should be done in two stages to allow one side to dry before it is turned over.

The result is a deep, dark, transparent lens which is very close to the original in shape and colour.

Pedistal Lamp Lens

First, a mould from which to shape a lens must be made. The first step is to make a wooden mandrel the same size as the internal diameter of the original lenses. The mandrel is then covered with aluminum to give a smooth finish. Another piece of aluminum is used to fix the outside diameter large enough to allow forming a lens. The mandrel is covered with saran wrap to prevent sticking. Resin is then poured between the mandrel and the outer diameter aluminum sleeve and allowed to harden. The mandrel is then remounted on the lathe and the lens is machined to size and shape. After removal from the mandrel, the lens I.D. is usually marked from the mandrel. These marks show up when the lens is finished. To smooth this surface, the lens is mounted in the lathe and rotated at a medium speed. Coloured resin is added to the internal surface of the lens. The centrifugal force causes the resin to level out giving a smooth surface.

The lathe is then slowed to a very slow speed. The lens is mounted and the outside is given a coat of coloured resin. Rotating the lens while drying gives a smooth finish with no runs.

The lens is then cut like a pie to give the exact size of lens required. Two lenses are usually available from each casting.

The above process was developed via numerous trial and error efforts. (I started off with Canadian Tire marine resin and a plaster of paris cast.) If you are interested in trying to make lenses, please contact me before you start. I'm sure I can save you considerable time and effort.