

Linden Thermoplastic Pellets

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The use of Linden Thermoplastic in Compo Frame Conservation

The conservation of compo frames frequently involves the reproduction of compo molding (the applied molding material made of whiting, resin, animal glue and linseed oil formulations). For several years I have successfully used thermoplastic materials to make molds from original frame surfaces. The following notes describe the advantages and working practice of using Linden Thermoplastic on compo applied molding frames.

The mold material

Linden Thermoplastic is a non-hazardous polyester product with a thermoplastic nature, i.e. It has a low melting point and plasticity over a wide temperature range just above ambient temperature. Linden Thermoplastic has a melting point of 60°C, a freezing point of 35°C and crystallization occurs at 26°C. Upon manufacture the thermoplastic, which is a polycaprolactone, is extruded into white 3mm pellets, which become clear when melted. The material is odorless and stable in air and water to above 150°C. The low coefficient of thermal expansion enables it to be well suited for making accurate mold impressions.

The benefits and limitations of Linden Thermoplastic

The choice of a mold making material will be dependent on a variety of factors, such as size, the degree of undercut, refinement of detail and the number of reproductions required. In some cases it will be preferable to use one of the superior mold making materials, although they are expensive and cannot be re-molded. Often the use of a thermoplastic mold making material provides a suitable alternative, particularly for the reproduction of small sized, local compo losses often found on Victorian frames.

The speed and ease of application of Linden Thermoplastic make it very advantageous to use, in addition to the benefits of economy. Thermoplastic molds can be re-melted and the material reused, and Linden Thermoplastic is not expensive. The successive use of Linden Thermoplastic will depend on how clean the molds remain, and multiple pressings from a single mold may lead to less accurate moldings as the warm compo will gradually alter the mold impression. Linden Thermoplastic is biodegradable, and the material will become brittle when left in contact with microbes. The thermoplastic nature also means that the mold impressions will lose definition over time, and molds should not be used for long-term records. Stored in normal conditions in sealed clean containers, the shelf life of Linden Thermoplastic is expected to be 2 to 3 years.

Using Linden Thermoplastic

The frame element to be reproduced should be secure and the surface layers well consolidated. To aid the release of the mold material the area must first be prepared by dusting with French chalk or talcum powder. Alternatively a light nut oil could be brushed over the area, but care must be taken to thoroughly remove the oil residue with mineral spirits and the application may be incompatible with oil gilding materials. Clean your hand well before handling the Linden Thermoplastic to avoid contaminating the material and prevent it from sticking to your fingers at a crucial stage. Immerse the Linden Thermoplastic in almost boiling or just boiled water in a clean container, such as a glass or stainless steel bowl. The pellets quickly melt together and attain

the consistency of chewing gum. Scoop out the Linden Thermoplastic with a teaspoon and after a moment the material can be handled with wet fingers. Squeeze the softened pellets into a ball and form an appropriate shape to cover the frame area to be reproduced. The side to be applied to the frame must be free of folds, and it may be helpful to briefly re-immense the material in the water once the shape is formed. The warm material should be quickly manipulated onto the frame. At this stage it is easily pliable and will conform to the surface undulations, while remaining dense and firm enough not to overflow. The material appears most transparent when it is being fattened on the frame. Trapped air bubbles are undesirable and should be pressed out early. Unless it is desirable to reproduce edges beyond the molding, restrict the edges of the Linden Thermoplastic by holding your fingers level with the base of the molding you want to reproduce. A lip of plastic on the mold could interfere with compo pressing. Leave the Linden Thermoplastic on the frame until it has solidified between its freezing and crystallization temperatures, which is above room temperature. The material should be almost completely opaque when it is possible to gently disengage it from the frame at the edges of the mold. The inside of the mold will still be warm, and should be left for five minutes or so to cool completely before pressing the compo. If the mold is left to solidify completely on the frame there is a risk of removing the original compo element. Should the original compo molding be accidentally removed along with the mold, the Linden Thermoplastic can be bent just enough to pick out the element which will have to be re-adhered to the frame. Only secure areas should be used for the production of molds. Linden Thermoplastic should not be used to reproduce moldings applied to wire supports.

Undercuts

It may not be suitable to use thermoplastic material to reproduce elements which are very undercut, such as where they were cut away after application of the frame, or if they were made of a cast upper section to which compo was added from the back to build up thickness. It is, however, possible to use Linden Thermoplastic for elements which are slightly undercut. The undercuts should be filled with Plastaline (this modeling wax is preferable as it is non-staining) or plasticene before applying the mold material. This is only possible if the element and its surface layers are secure, and if they can be safely cleaned. The filler material should be thoroughly removed afterwards and any oily residue must be cleared with mineral spirit. It may be possible to apply Linden Thermoplastic over very minor undercuts without tilling, because the mold material retains a degree of flexibility. If necessary, minor undercuts which have been molded can be cut out with a scalpel while it is still warm. It may also be possible to cut unwanted edges with scissors. It is desirable to avoid molding undercuts in the mold material in order to facilitate the compo pressing.

Pressing the compo

The Linden Thermoplastic mold will be ready for pressing compo once it has completely cooled to room temperature. The mold should be dusted with French chalk or talcum powder before pressing. Thicker Linden molds can be pressed in a book press or vice; alternatively the molds can be pressed by hand between boards. Care should be taken not to overheat the compo before pressing it into the thermoplastic mold; the best working temperature for compo is 49°C.

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