

Conservation of a Glass Cup using a Transparent Mould Technique

(poster summary)

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Conservation treatment was undertaken on a glass cup excavated in Ljubljana, dating from the late fourteenth century. The glass is transparent with a slight olive-green tint. A cross-ribbed pattern on the body was formed by mould blowing. The applied foot ring was pinched to produce a series of rounded spikes. A coiled blue thread was trailed around the centre of the cup.

The five remaining fragments form half of the cup, including one whole side from the foot to the rim. It was a challenge to restore the missing part because it was so extensive and because the glass is so thin, with a pattern-moulded surface. When restoring missing areas of glass objects with epoxy resins there can be many problems, including the fixing of the moulds to the glass, the injection of the epoxy resin, bubbles forming within the fill during setting, and shrinkage of the epoxy. In order to control the process as much as possible we chose to use a technique utilising a transparent mould, which was developed at the National Museum of Slovenia (Lemajič 2006).

The fragments of the cup were first cleaned and then bonded with epoxy resin. Because of the size and complexity of the missing area, the restoration was carried out in two steps. First the foot was restored using an inner transparent poly(vinyl chloride) (PVC) mould and an outer silicone rubber mould filled with epoxy resin. The next step of modelling of the body was a particular challenge because of the curvature of the wall and its moulded pattern. For this part, the heated transparent PVC foil was formed between two plaster moulds (positive and negative) rather than shaping over one plaster mould, as usual. The outer transparent mould enabled us to control the fixing of the moulds to the glass and the flow of resin.

By using a transparent mould, it is possible to see if air bubbles are becoming trapped within the resin during setting. Air bubbles can form if the gap to be filled has a complex configuration with sharp angles. If an air bubble appears in a thick resin cast, it will rise spontaneously and can be directed towards the hole in the mould by tilting the object. If, however, the resin cast is thin, the surface tension formed between the walls of the inner and outer mould tends to keep the bubble in place. Tapping gently on the transparent mould with a metal spatula precisely at

the place where the bubble is located produces vibrations that overcome the surface tension and help the bubble to rise towards the air hole.

But if the air bubble is trapped in a sharp corner and cannot rise towards the air hole, tapping on the mould will not help. First the bubble must be forced down and around the edge of sharp corner, so it can rise towards the air hole. This can be done by inserting a small metal ball into the mould, holding it with a magnet from outside the transparent mould, and moving it alongside the bubble. Then the ball can be dragged with the magnet and pushed towards the hole and out of the mould.

Reference

Lemajič, G. 2006, 'Transparent PVC mould: Replacing missing pieces on hollow glass objects', *Icon News*, 3, 46-48.

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Figure 1. The restored glass vessel (late fourteenth century, National Museum of Slovenia, N6604) surrounded by mould materials and castings used during the restoration process.