

# Replicating Missing “Lanthorn” Panes: Another Use for the Versatile Melinex®

Ellen Promise, graduate fellow Winterthur/University of Delaware Program in Art Conservation

Bruno Pouliot, Winterthur Museum Objects Conservator and University of Delaware Adjunct Assistant Professor

## Abstract

For centuries before the mid 19th century, window-panes in lanterns were commonly made of horn. Though it transmitted less light than glass, horn was durable, abundant and much less expensive. To achieve the desired level of translucency, panes were crafted from light colored horns and most often obtained from flattened sheets of horn that were delaminated into two or more layers after prolonged soaking in water. This process resulted in considerable variation in thickness, direction of grain and tint amongst different horn panes.

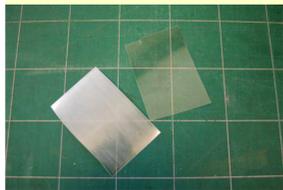
Horn-paned lanterns that have survived in museums or private collections often have one or more damaged or missing windows. For a conservator, replacing these panes with true horn is usually not practical, as it is difficult to obtain or process horn in the traditional way of the hornsmith. The use of real horn may also be undesirable, as it does not create a clear distinction with original panes, or because other components of the lantern may be too damaged to accommodate an entirely new and strong horn pane. Therefore an adaptable method for mimicking horn panes becomes a useful tool for conservators.

A method for imitating horn panes was initially devised in 2003 by Bruno Pouliot and employed on a lantern missing all three of its original panes. This method was then used by graduate fellow Ellen Promise in the fall of 2010 on a different lantern to create one pane in imitation of two horn windows that remained in place. The technique was used to great effect in two different scenarios, demonstrating that it is controllable and can be adjusted to fit individual treatment goals and imitate horn of different thicknesses.

The approach utilizes the polyester film Melinex® 516 and a 1:1 solution of Agateen Lacquer #27: Agateen Thinner #1 which has been appropriately tinted using Orasol® dyes and acrylic paints. To match the grain of horn and increase opacity, the polyester film is first sanded on both sides using fine grit sandpaper and Micro-mesh®. After the initial coloration has been applied to the polyester film with brush coats of tinted Agateen, further adjustments can be made using acrylic paints. The polyester film panes can be distressed to imitate aged horn by creating creases, undulations, or making strategic cuts with a scalpel blade. The method is easily accomplished, and the panes can be quickly inserted without any stress to the original lantern frame, while being barely distinguishable from real horn panes.



## Methodology



- Select appropriate thickness of Melinex® 516<sup>1</sup>. More than one sheet may be necessary. Cut sheet(s) to fit window opening in lantern.



- To increase opacity and imitate grain of horn, sand on both sides over soft surface using Grade 1200 sandpaper. Grade 1500 Micro-mesh®<sup>2</sup> can be used to remove irregularities.



- Brush-coat one side of sheet(s) with 2 to 3 layers of 1:1 Agateen #27 cellulose nitrate lacquer<sup>3</sup>: Thinner #1 tinted with Orasol® dyes<sup>4</sup>. Ideally use original horn panes as models, trying to match both color and opacity



- Locally apply acrylic paints to the coated side of the polyester film to introduce color variations, seen in true horn panes. The coated side of the film will be more saturated and textured and should face inward when the pane is inserted into the lantern.



- Once Agateen is dry, seal the surface with a layer of shellac to adjust sheen and, if necessary, color. Depending on the desired amount of color, orange shellac or blonde shellac may be used.



- To imitate aged horn, locally distress film by creating small creases and introducing minor cuts and abrasions with a scalpel blade.

<sup>1</sup> A registered trademark for thermoplastic, polyester film, currently manufactured by DuPont and formerly manufactured by ICI.

<sup>2</sup> A registered trademark for a series of cushioned abrasive cloths, available through Micro-Surface Finishing Products Inc.

<sup>3</sup> A brand name for cellulose nitrate lacquer, available through Talas.

<sup>4</sup> A registered trademark for a series of solvent soluble dyes, manufactured by BASE.

## Case Studies



Lantern 67.1808 before treatment.

### A Decorative Lantern

In 2003, a tinned iron lantern in the Winterthur Museum collection was treated by Bruno Pouliot in preparation for a publication and display. The metal framework of the lantern comprises many decorative elements, including various pierced designs. The crispness of these features suggests mechanized production, dating the object to the late 18th or early 19th century. There are six dormer-like projections from the dome, which add to the embellished appearance of the object.

### Past Modifications

Before treatment, several stylistic characteristics pointed to the past modification of the lantern. Most notably, four glass bays had been soldered to the underlying framework. The solder around the bays was applied poorly and thickly and appeared much darker than the solder seams visible elsewhere on the object. In comparing the two areas of solder, X-ray fluorescence (XRF) detected small differences in the relative amounts of copper and zinc. The glass bays obscured three window openings, with scalloped and pierced designs, similar to those on the lantern dome. Residues found within the metal sleeves on the interior of the

window frames were analyzed with Fourier transform infrared spectroscopy (FTIR). The resulting spectra matched well with a spectrum for modern ox horn and the spectra of samples obtained from another horn-paned lantern in the Winterthur collection. This confirmed that the windows on the lantern had previously contained horn panes. It was decided to remove the glass bays and return the lantern to its original appearance.

### Treatment of Windows

The glass bays were removed using a hot air gun and a de-soldering tool, followed by mechanical cleaning with a scalpel to remove excess solder. Although the use of true horn panels to replace the missing panes was considered, the methodology described above was ultimately developed to avoid placing stress on the interior metal sleeves. In imitation of horn panes, which are typically thin and translucent, one sheet of 5 mil thick Melinex® 516 was used for each of the three faux horn panes. Several different shades of Orasol dyes and Acryloid B-72 paint chips were used to tint Agateen, which was brush-applied only to the verso of the polyester film. Some additional color was added with a sealing layer of orange shellac. To remain consistent with the appearance and condition of the metal framework, the Melinex® panes were not

heavily distressed. In order to indicate the appropriate window and rotation for each of the three panes, small triangular cutouts (one, two, or three) were made in the bottom edge of each sheet. The imitation panes were then gently inserted into the lantern.



Lantern 67.1808 after treatment.



Lantern 2010.0012.004 before treatment.

### An Everyday Lantern

The lantern treated by Ellen Promise in 2010 was acquired by Winterthur Museum in 2009 as part of the Roland Cadle Historical Hornware Collection. The metal framework is tinned iron, and the form and construction are typical of English and American lanterns from the 19th century. Unlike the object treated by Bruno Pouliot, this lantern is virtually unadorned and would likely have served a predominantly utilitarian purpose.

### Extant and Missing Panes

Two of the three window openings contain horn panes. Before treatment, an untinted sheet of plastic was serving as a replacement for the missing horn pane. The plastic insert had become thickly coated in grime. The two remaining horn panes are each approximately 1/16" thick. This is much thicker than average, compared with horn panes in other lanterns in the Winterthur Museum collection. The thickness of the horn panes lends them a semi-opaque quality and a dark yellow coloration. The aberration in thickness could be a sign that these panes are not original to the object, but are old replacement panes, fabricated at a later date by an inexperienced hornsmith; or it could

be another indicator of the lantern's practical function. The condition of the horn panes suggests age and use: throughout their surfaces, there are scattered abrasions, discolorations, and superficial cracks.

### Treatment

In crafting the new replacement pane, two sheets of 5 mil thick Melinex® 516 were needed to achieve the proper illusion of thickness and opacity. The panes were cut to fit the thin metal sleeves on the interior sides of the window opening. Lengthwise, the Melinex® sheets were cut to rest comfortably on the bottom of lantern, to reduce the likelihood that they will slump or slide down in the future. As there are two existing horn panes in the lantern, one with a vertical grain and one with a horizontal grain, a decision was made to imitate the general appearance of the pane with the vertical grain, set in the door panel. This pane is in better condition, as the other pane is significantly bowed outward. The imitation horn panes were fabricated according to the methodology outlined above. Super blonde shellac was selected to seal the Agateen, because no additional color was desired. The Melinex® sheets were adhered together using double-sided tape so that the coated sides are

sandwiched together and do not touch the metal framework. This method of adhesion was chosen for its flexibility and ease of application. A triangular notch was cut into the top edge of the interior Melinex® pane to identify this as the interior side, and two semicircular notches were cut into the bottom edges of both Melinex® panes to allow the vent holes around the bottom of the lantern to remain uncovered. The completed pane was then inserted into the lantern.



Lantern 2010.0012.004 after treatment: comparison of imitation (right) and original (left) panes.

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## Handouts