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Tip: A Hot Tip! The Use of a Soldering Iron for Conducting Polyester Encapsulation of Paper Objects

INTRODUCTION

The encapsulation of paper objects in polyester sleeves has become standard practice by paper conservators. Encapsulation allows fragile paper artifacts to be handled, while greatly reducing the physical abuse incurred during handling. Currently, the two most popular methods of encapsulating polyester are heat-based edge welders and ultrasonic welders. These welders have proven to be very efficient for conservation labs that have large workflows that include encapsulations. Both systems have been proven to be very user-friendly. Both systems also produce clean, sharp, and strong welds. But while both systems have many benefits, they also have many limitations as well. Due to the high purchase cost for the edge welder and the even higher cost for the ultrasonic welder, the practice of conducting encapsulations has largely been limited to conservators working in institutional conservation labs. Both systems also generally require the use of a permanent location in a lab, potentially tying up often precious table space. Due to these limitations, it has been largely prohibitive to be able to conduct encapsulation at many small labs that have neither the budget or the space to maintain either system.

This talk will demonstrate how to use a traditional soldering iron to produce clean strong welds between two sheets of polyester. Soldering irons are readily available tools that can generally be purchased very inexpensively at virtually any hardware store, allowing both institutional conservation labs as well as small private practices to purchase them on tight budgets. They are small enough that they can be left in a drawer when not in use, therefore not taking up permanent table space in a lab. Soldering irons also travel easily, allowing for the possibility of conducting encapsulations on site. The use of soldering for encapsulation will also allow for rounded welds, as well as straight line welds of virtually any length. This talk will demonstrate the benefits of using a soldering iron to conduct encapsulation.

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BENFITS OF USING A SOLDERING IRON FOR WELDING POLYESTER FILM

Ultrasonic and heat-based edge welders are widely known and generally considered one of the more essential pieces of equipment in paper conservation labs. Both systems have been around for over 30 years and are well established. In conservation labs that already have one of these systems, the use of a soldering iron to weld polyester film should not be thought of as a substitute method for either of these machines, but rather should complement them. In situations where labs are not able to accommodate either system due to budget or space concerns, a soldering iron may allow for a conservator to conduct polyester encapsulations where it would not have been a possibility before.

There are several benefits to welding polyester films with a soldering iron. First, soldering irons are very small, often not much larger than your average pencil. This means it can be put away in a drawer when not in use and doesn't take up any permanent table space in a lab. Its size also allows for portability. A soldering iron can even be packed in a checked bag for travel, allowing for encapsulations to be conducted on site or anywhere where there is a table. There are even battery-powered soldering irons for when there might not be a power source available.

Soldering irons are very inexpensive and often can be purchased for as little as $20. This allows for encapsulations to be done by virtually anyone, once properly trained. It even allows for budget sensitive private practices, historical societies, libraries, museums, or archives to conduct polyester encapsulations where they may have thought it could not have been done before due to budget or space. In labs where doing an encapsulation is infrequent and a more expensive system may not be perceived as cost effective, a soldering iron may be the ideal substitute.

Welds with a soldering iron can be done at virtually any length where the only limitation is the length of the straight edge. The ability for the soldering iron tip to follow nonstraight edges also allows for round welds to be conducted on unusually shaped paper objects. Finally, the soldering iron allows easily

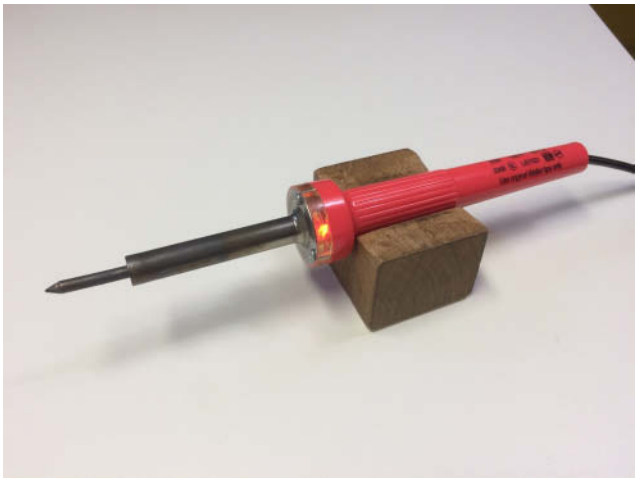

Fig. 1.

allows for "tack welds," which can be used to "float" double-sided paper objects between two sheets of polyester film.

WELDING THE POLYESTER FILM

Most soldering irons can be used to weld polyester film, but, for the purposes of this article, the soldering iron that was used was the Weller Model SP23LM 25 watt soldering iron (fig. 1). This soldering iron allows for the tips to be changed and can also be purchased online and at most hardware stores for about $20. To get the best welds, the optional pointed tip should be used and sanded down to as fine a tip as possible. The supplies require to weld polyester film, in addition to the soldering iron, are a good heavy straight edge and strips of museum board to weld on. For the easiest and most efficient encapsulations, it is recommended that 3-mm polyester film be used.

Welding polyester film using a soldering iron is easy. Simply put two sheets of polyester film on a strip of four-ply museum board and put a bag weight on top to prevent movement. Then line the straight edge up with were the weld should be. Run the soldering iron slowly down the straight edge several times until the soldering iron has melted all the way through the film into the board below (fig. 2). The weld will be completed when the film is stuck to the board and, upon close examination, the weld appears to have cut through the film (fig. 3). To remove the film from the museum board simply bend the film backward against the board (fig. 4). The film will make a slight cracking sound as it separates from the museum board. In the event the film doesn't come off, slide a thin microspatula under the film to remove it (fig. 5). After the first weld is completed, complete the other three sides to finish the encapsulation (fig. 6).

USING TACK WELDS TO FLOAT PAPER ARTIFACTS

A soldering iron can also be uses to create "tack" welds as a very discreet method of suspending a sheet of paper between

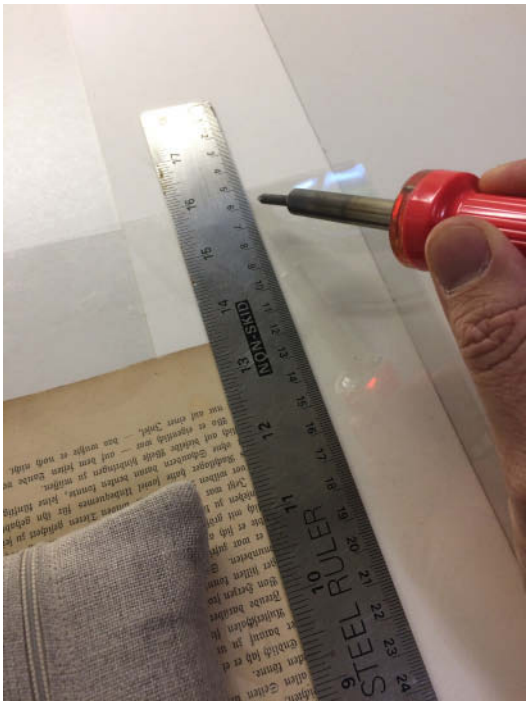

Fig. 2.

Fig. 3.

Fig. 4.

two sheets of polyester film (fig. 7). This can then be used as an alternative method for the display of double-sided paper artifacts where the entire sheet of paper needs to be seen, giving the appearance that the paper is "floating." An

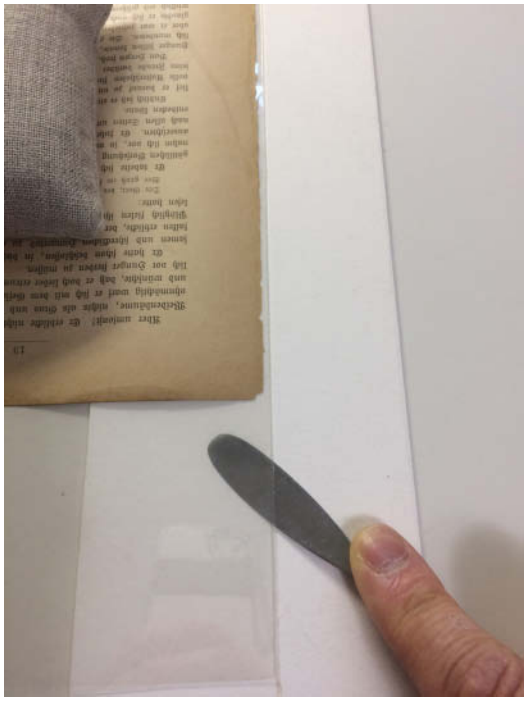

Fig. 5.

Fig. 6.

additional benefit of this type of display is that no additional adhesives or hinges are introduced to the paper artifact.

The steps for doing a float display using tack welds are like the steps previously described for doing an encapsulation. The only additional required materials are the two sheets of museum board used for the window mats. The first step is to cut two identical window mats with windows that are larger than the paper object. The amount of open floated area of the opening is an aesthetic choice. Hinge both window mats

Fig. 7.

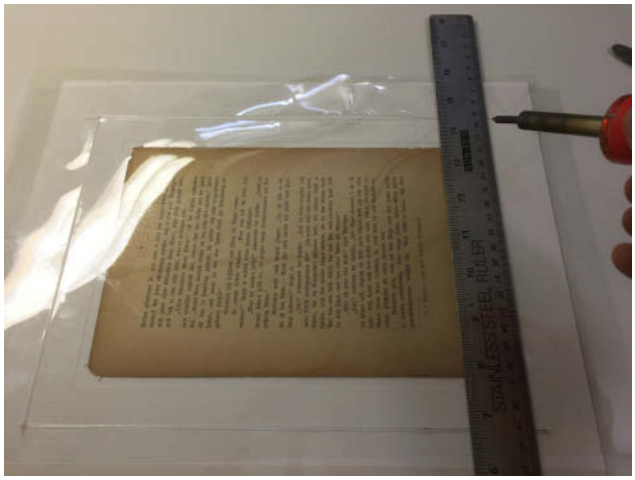

Fig. 8.

together and put off to the side along with the cutouts from the windows. Put the paper object between two sheets of polyester film and slip a piece of scrap museum board under one of the corners of the paper object. Using just the tip of the soldering iron, and holding the soldering iron perpendicular

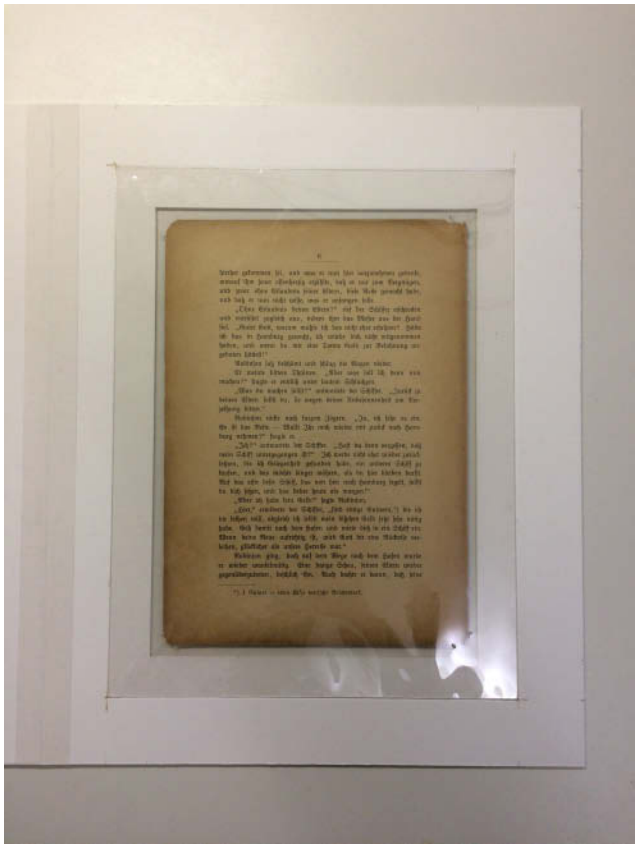

Fig. 9.

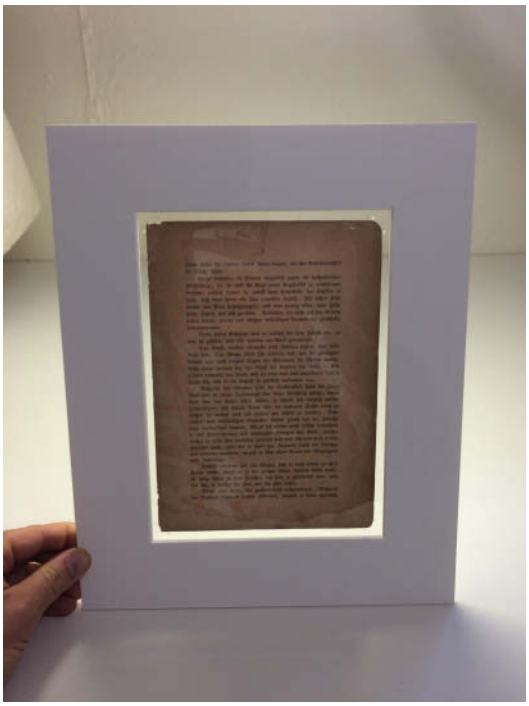

Fig. 10.

to the surface, touch the tip down along the edge of the paper object slightly off from the corner. Press down on the soldering iron for about one second and repeat along the corresponding edge of the same corner to "hold" the paper in place in that corner. Once the two tack welds are completed, slide a thin microspatula under the film to release the film from the museum board. Repeat the tack welds in the other remaining three corners. The paper should now be held in place, between the two sheets of polyester film, using eight tack welds. Open the hinged window mats with the inside face-up and place one of the cut outs back in one of the windows to support the center. Place the paper object, inside the film, on the window with the cut out and position it in the middle of the opening. Place a weight on the paper to prevent it from moving. Using a straight edge, weld all four sides of the film about one inch outside the beveled edge of the window. This will fuse the film to the museum board (fig. 8). Carefully bend the off-cut film back against itself to remove it. If it won't come off, carefully slide a microspatula under the weld to assist with removal. Once the off-cut film is removed, the window mat can be closed and put into frame with glazing on both sides of the window mat to allow for viewing of both the front and the back of the piece (figs. 9 and 10).

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