## AQUA-RESIN® FOR COATING CARVED RIGID FOAM AND HARDWARE CLOTH STRUCTURES

*by Louis Lieberman*

In our first article on Aqua-Resin® we discussed working in molds, either to produce thin-walled laminations, or in the case of smaller pieces, casting solid. In this article we are going to discuss making sculptural objects by direct coating procedures with Aqua-Resin®. There are a number of reasons one might want to coat an object with Aqua-Resin®, one of which is for surface effects: for instance, changing the color or texture, adding a faux finish such as a bronze or stone-like surface, or perhaps protecting the form from the elements. Two other reasons for Aqua-Resin® coating are to protect a carved rigid foam object from physical damage by fortifying its surface, and secondly to provide a surface to a structure that virtually has none, as in the case of a form made from wire mesh (hardware cloth). It is these two cases that we will discuss here, leaving surface effects and treatment for a future article.

In all cases below it is assumed that basic mixing procedures for Aqua-Resin® are already understood, either by having referenced the previous article in the Fall 2008 *The Painter's Journal* (vol. 6, no. 2), or by having read the printed L/S3™ instructions that are on the the Aqua-Resin® website, or supplied with the product (see Figure 1).

HARDWARE CLOTH STRUCTURES

Coating hardware cloth structures requires a technique similar to but slightly different from that used for foam structures. Some shapes lend themselves to being fabricated with hardware cloth; forms that need to be hollow for various reasons and shapes that are composed of gently curving planes are two examples. In many cases the lack of perfect flatness of the hardware cloth, and the grid structure itself, gives visual interest to the various planes, and is one reason to choose it. Hardware cloth itself is quite easy to fabricate with, and the techniques for doing it are already understood by most artists, or easily found in various sculpture and "how to" prop books. The mesh size of the hardware cloth to be used will vary with the size, geometry, and fabrication techniques, but the basic procedure for coating the structure with Aqua-Resin® will remain unchanged. A 1/4" mesh is perhaps the most common size used for most structures, though 1/8" or sometimes even 1/2" mesh is also useful (Figure 2). In some cases expanded metal plasterer's lath can also be used.


*Figure 1*

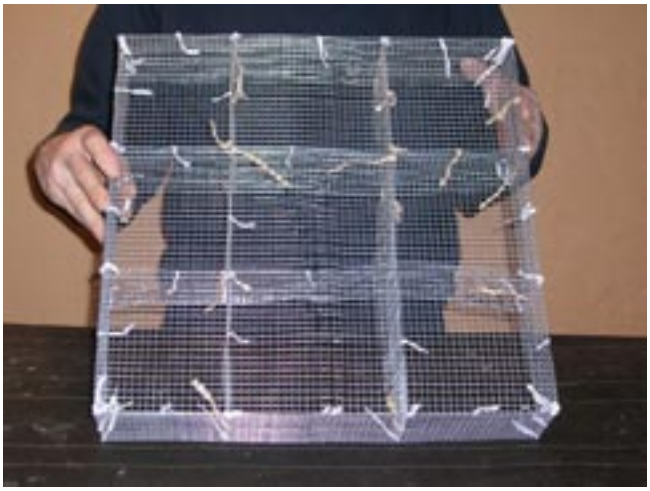

*Figure 2*

When applying Aqua-Resin® to a hardware cloth structure, two necessary objectives should be kept in mind: one is that you don't want any substantial amount of the Aqua-Resin® mix to fall through the mesh opening, and the other, conversely, is that you do want enough of the Aqua-Resin® mix to go through to the mesh to firmly anchor it to the mesh. This may sound tricky, but in fact is quite easily done; there are two main techniques.

SLURRY SKINNING

This technique is used where extra strength is required. We will need to alter the Aqua-Resin® mix so that it has a great enough viscosity, and add fiber, so that it will not readily run off or fall through the open mesh. 1/4'" or 1/8" mesh is best with this technique.

To a normal Aqua-Resin® mix, add a small amount of Aqua-Resin® thickener—THX-6™. This is best done by premixing a quantity of THX-6™ with an equal amount of water, and then adding this mixture in small quantities with repeated stirring until a viscous (sticky), just barely brushable, slurry is produced. Now add 1" Aqua-Glass™ fiber, approximately 0.5% by weight of the total mix. If no scale is available, a reasonable approximation is to add about a pinch of Aqua-Glass™ (the size of a dime) to about a cup (8 fl oz) of this thickened Aqua-Resin® mix. Please note that too much glass will make it hard to brush the mix, and also note that conventional fiberglass will not work well for this; it needs to be Aqua-Glass™.

With a little experience, the correct proportions of both the Aqua-Glass™ and THX-6™ are easily determined. The goal is to have a mix with enough Aqua-Glass™ to keep itself from falling through the openings in the mesh, and enough viscosity and tack to keep it in place especially on vertical surfaces. When mixed correctly, it will appear almost to be dough and can be either brushed or troweled in place depending on the contour of the hardware cloth structure, thickness of the mix, and personal preference (Figures 3 and 4).

Once the slurry has hardened, it may, if necessary, be planed back with a Sureform® tool, and/or be wet-sanded with waterproof sandpaper. It is best to wait a few hours before wet-sanding to prevent "fuzzing" of the Aqua-Glass™. However, if immediate sanding is necessary, a normal Aqua-Resin® mix may be applied as a final top coat, which can then be sanded once hard in about 30-45 minutes.

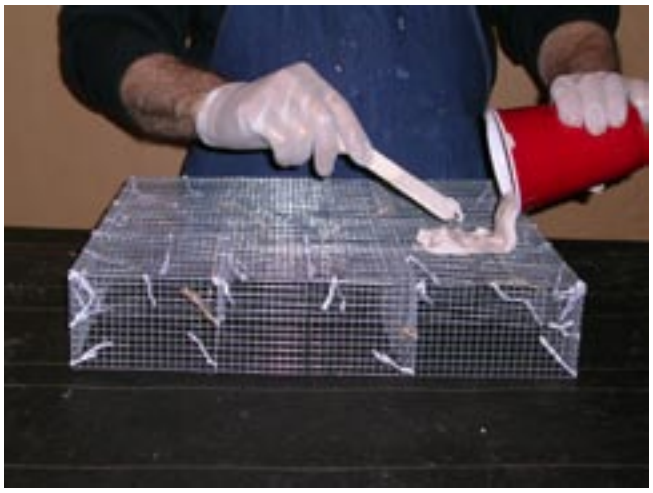

*Figure 3*

*Figure 4*

Depending on the thickness of the application of the Aqua-Resin® thickened mix, the openings in the hardware cloth might have left hollows in the new Aqua-Resin® surface; this visual effect is sometimes not a problem, or may even be desirable. If however, the hollows are not wanted, a THX-6™ thickened mix similar to the one first applied, but without the Aqua-Glass™, can be troweled on, filling in the hollows. Once substantially hardened, this layer may be wet sanded back to a flat, smooth surface. At this point, paint or any desired surface treatment can be applied.

VEIL SKINNING

This, the second technique, is the easiest and most common procedure for coating with Aqua-Resin®. It is done with Aqua-Resin® brand surfacing veil—Aqua-Veil™ saturated with a normal Aqua-Resin® mix. Aqua-Veil™ is a continuous strand or long-fibered, non-woven fiberglass "mat" material available in three weights: 10, 30, and 50 mil. The technique employed is to saturate pieces of either 30 or 50 mil Aqua-Veil™ with a normal Aqua-Resin® mix, and then apply to the structure by brushing them in place with a "chip" or similar brush.

Typically a piece of veil of suitable size, usually not more than a few square feet, is placed flat on a hard waterproof surface, such as plastic laminate (Figure 5). The Aqua-Resin® mix is painted onto the veil, making sure to fully wet it through (Figure 6). Immediately the saturated veil is lifted up at one edge and applied to the structure, and then tamped and brushed in place with the chip brush (Figures 7 through 12). Additional pieces of veil are added to complete the process, making sure to

*Figure 5*

*Figure 6*

*Figure 7*

*Figure 8*

*Figure 9*

*Figure 10*

*Figure 11*

*Figure 12*

overlap the pieces of the veil about 1/2 to 1". Once in place and still wet, the overlapped area, or any folds or wrinkles, can be tamped out with a chip brush. (The binder holding the fibers together in Aqua-Veil™ is soluble in Aqua-Resin®, which will dissolve it, allowing it to meld into itself.) Once this layer has solidified, it may be treated in any of a number of ways: it may simply be painted, or if needed, additional layers can be added, or perhaps a coat of Aqua-Resin® mix, thickened or not, can be painted on to serve as a sanding or leveling coat.

Depending on the strength required, the wet Aqua-Resin® may be sufficient to bond to the hardware cloth. If there is access to the back of the hardware cloth, once the veil layer has solidified, a coat of a normal Aqua-Resin® mix may be painted on to insure a better bond to the hardware cloth. This second coat is perhaps desirable, but is often not necessary. This veil skinning technique may be done to both horizontal and vertical surfaces

FOAM COATING

Any type of rigid foam can be coated with Aqua-Resin®: urethane, EPS, Styrofoam®, etc. (Figure 13). Often Aqua-Resin® foam coating is employed, not only for ease of use, and health and safety reasons, but also because, as in the case of coating with polyester resin, the styrene content of the resin dissolves the polystyrene foam, necessitating either a protective barrier coat or a switch to the more expensive urethane foams.

The thickness of the gel/surface-coat over a foam shape is usually determined by a balance of two factors: the strength required and how much loss of detail can be tolerated. Using the range of weights of Aqua-Veil™ available (10, 30, and 50 mil) a suitable thickness is selected and applied in much the same way Aqua-Veil™ is applied into a mold for a gel/surface coat. Please note that the 10 mil FF veil is particularly non-irritating and is recommended for individuals with sensitive skin; since this is the lightest veil, several layers may be required.

*Figure 13*

First a heavily applied normal Aqua-Resin® mix is painted onto the foam surface. Then a dry piece of Aqua-Veil™ of suitable weight and size is applied to the wet mix with a chip brush using a tamping motion to push the veil onto the surface and into the contours (Figures 14-16). Because, as stated above, Aqua-Veil™ is manufactured with a binder that is soluble in Aqua-Resin®, any folds and wrinkles can be simply tamped down and made to flatten and follow the contour with no high spots or bulges. As pieces of veil are added they should always be applied onto wet, freshly applied Aqua-Resin® mix, and overlapped 1/2" to1". For additional strength, if necessary detail will not be obscured, another layer of veil may be applied in the same manner as the first layer.

A final coat of Aqua-Resin® mix is then applied with no veil reinforcement (Figure 17). This second coat will allow enough extra material for sanding and finishing operations. In cases where the contour has too many complex curves, and veil covering may not be desirable, the same fibered, THX-6™ thickened mix used for hardware cloth structures (as described above) may be applied to the foam.

When maximum strength is required, an initial layer of 3/4 oz. chopped strand fiberglass mat can be applied (as described in the "L"/S3" instructions) as a base layer directly on the foam before applying any veil layers (Figures 18, 19). This is often done on parts of the foam structure that may be subject to extra wear, for instance at the base of a structure that could get some foot traffic or kicking, while leaving any upper, out-of-reach parts of the structure with only a light veil coating. For maximum surface smoothness, when using an initial chopped strand mat layer, a layer of 10 mil Aqua-Veil™ should immedi-

*Figure 14*

*Figure 15*

*Figure 16*

*Figure 17*

*Figure 18*

*Figure 19*

*Figure 20*

*Figure 21*

ately be placed over the still wet (uncured) mat, i.e. "wet into wet" (Figure 20). To further increase smoothness in any veil application, and again while it is still in the wet-uncured state, some suitable "tool," often the heel of gloved hand, can be used to smooth and remove any texture from the still curing Aqua-Resin® (Figure 21).

GLUING RIGID FOAM WITH AQUA-RESIN®

Aqua-Resin® makes an excellent glue-mix for all types of foam. Aqua-Resin® can adhere and set dry in between foam layers, where single component glues can't work because of lack of air-dry possibilities. It is also repositionable, before setting, unlike most contact cements. It is important to use the correct mixing proportions for foam gluing; when mixed at about 1 part L to 4 parts S3 by weight or 1 part L to 3 parts S3 by volume, all the water in the Aqua-Resin® glue-mix gets chemically combined into the cured Aqua-Resin®, and therefore no air-drying is necessary. It is important to note thinner mixes may not work as well, if at all. The mix produced at these proportions is quite thick which prevents it from running to the edge of the glued foam pieces. If the foam pieces to be glued are already carved to shape, the Aqua-Resin® glue-mix can be applied edge to edge; but if the foam pieces are to be glued, then carved, the Aqua-Resin® glue-mix should be carefully applied to be kept well away from any area that will be carved, otherwise the mix when set will make carving difficult if it needs to be cut away with the foam (Figure 22).

In all cases the glue-mix should be applied to both surfaces with a notched trowel, and immediately pressed together. It is important to use a notched trowel when applying the Aqua-Resin® glue-mix, as this will insure an even thickness, and

*Figure 22*

*Figure 23*

thereby prevent extra glue-mix from migrating too close to a carved portion of the foam (Figure 22). Toothpicks or sharp dowels can be used to "nail" the foam pieces together while the Aqua-Resin® is curing (Figure 23). This will help prevent shifting of the foam before the Aqua-Resin® glue-mix hardens.

Hopefully the directions and procedures outlined here for surface building are not only easy to understand and implement, but also suggest other possibilities for these techniques. For instance, coating procedures need not be limited to only hardware cloth and foam. Since Aqua-Resin® adheres to so many substrates, it is possible to employ these techniques on various other surfaces and structures. For more photos, and perhaps inspiration, please visit the Gallery on the Aqua-Resin® website: www.aquaresin.com.

The carved foam Greek column (Figure 24) for this article was provided by Foam Carver of Vadnais Heights, MN. www.foamcarver.com.

## ABOUT THE AUTHOR

Louis Lieberman is the President and Technical Director of Aqua-Resin®. He has a BFA in Painting from the Rhode Island School of Design (RISD), and a Bachelor's degree in Biology/Chemistry from Brooklyn College of the City University of New York. He is also a graduate of Brooklyn Technical High School, where he first developed his "love of materials." Louis had been a full time sculptor since leaving RISD, and in the late 1970's developed Aqua-Resin® for his own work. Approximately a decade later, he trademarked Aqua-Resin® and made it available to the general public.

*Figure 24*