



Cold Patination Antiquing Fluid Guidelines

Pre Treatment:

It is vitally important to remove any traces of metallic oxides or other contaminants, (i.e. oils, greases or polymers etc), from the surface of the articles as these are barriers to successful chemical treatment, otherwise the resulting finish will be patchy, uneven or otherwise less than efficacious; in cases of severe surface contamination, no colour reaction at all will occur. In some cases however, these selective effects are the very effects that are sometimes desired. However for the purposes of this exercise we shall assume they are not.

For the removal of oils and greases, generally a warm neutral or detergent alkaline type pre-cleaner will give sufficient cleaning power. This can be carried out by total immersion in a solution of these products, or in the case of larger structure, by mopping or swabbing. The importance of precleaning cannot be overstated, as the subsequent colouring process is a chemical reaction between the Antiquing Fluid solution and the surface of the article. If there is any barrier present between the two then no reaction will take place. It is also in some cases necessary to deoxidise or condition the surface of components to reactivate the surface as a preparation for processing. This is particularly important in the case of highly polished articles, which acquire a thin invisible oxide layer over which no reaction will be perceived in the colouring stage; this is referred to as passivity. This can be overcome by the use of very dilute inhibited Armadox (hydrochloric) or Cidox (citric) acidic pickles which will remove this layer successfully without damaging the polish finish, always assuming that the articles have gone through a degreasing stage first. Contaminants will likewise be entrapped or occluded in crevices within the metal itself or in the structure of the oxide film.

Therefore to summarise:

- i) The greases are removed by alkalines or detergents, and
- ii) The oxides are removed by acidics.

In every case where copper and brass is being prepared, the above notes will be appropriate throughout. Bronze alloys however present a different problem. In that although degreasing techniques are the same, the passivity problem will not be overcome with acidic processes. Bronze is an alloy containing copper and tin (as opposed to brass, which is a mixture of copper and zinc). Here therefore we have two elements, which are respectively noble, and semi noble, tin and copper. Noble metals, particularly in combination will not readily be affected by acids; the tin is very important in the formation of a resilient oxide layer which resists common strong alkaline processes. Much antiquing these days is carried out on imported semifinished articles that have had a lacquer coating, which must be completely removed before treatment. Any proprietary methylene chloride based paint stripping system can be utilised, however following its use; the surface must be thoroughly processed through the pre-treatment cycle here above described. Sometimes lacquers can take a considerable time to remove completely; lacquer residues left on the surface will not be adequately removed by the subsequent degreasing or deoxidising process unless the degreaser is a heavy caustic type cleaner. Bright-unpatinated patches or bright spots will show evidence of incomplete removal on the surface. In some cases, only scouring of the surface will remedy this problem, in the case of non-polished surfaces, the choice of effects are even wider and the pre-treatment stage can be utilised to impart a surface effect that will be enhanced by the subsequent colouring. The use of scourers or abrasives will give good uniform surface effects and enhance the colouring by removing all surface contaminants in one operation without the use of chemicals. Sand (garnet) or bead blasting will also perform the same job on large outdoor articles. Bronze alloys, in nearly every case except that addressed above will require this type of sand blasting as bronze surfaces tend to revert to a 'passive' state very quickly rendering chemical bronze treatments exceedingly difficult.

It should be appreciated that certain articles by their very shape and size will predetermine the most obvious method of pre-treatment. In the case of coins, medallions and similar small metalwares, these being items that have been produced by a stamping process. The very action of bright dipping means that the surface layer of the metal is removed completely leaving a pure open substrate, the perfect surface to receive any subsequent process, including colouring. Nameplates and memorial plaques, which can vary considerably in size, are usually best treated with a blast finish preparation. The criteria for pre-treatment of colour bronzing are exactly those as deemed appropriate to other form of metal finishing such as electroplating; non electrolytic ionic exchange reactions such as those in the Antiquing Fluid processes require a chemically clean, open reactive surface to achieve satisfactory results.

Colouring

The colouring process is relatively simple but certain common sense rules must first be observed. Rule 1 it is never a good idea to allow the colouring solution to be contaminated by any of the pre-treatment processes, therefore thorough swilling of the articles prior to immersion in the Antiquing Fluid is absolutely essential, Failure in this regard will render the colouring solution chemically unbalanced and may needlessly shorten its life. These solutions are designed to give long life characteristics when treated properly. There is no limit on the shelf life of these processes. Treatments can be carried out by either:

- a) Total immersion,
- b) By a barrelling process,
- c) By brushing or swabbing,
- d) Or by texturing (when elaborate pattern effects are required such as spotting, stippling or dabbing).

An immersion process will require a vessel with sufficient depth and other dimensions to allow total immersion thereby allowing the reaction to take place evenly or uniformly over all surfaces. Reaction times are usually between 2-5 minutes, darker effects (gunmetal black) 10 minutes. Small articles can be wired or contained in a dipping basket, When using a dipping basket, the work must be kept mobile by shaking the basket to avoid shielded areas when two or more components touch. When processing is carried out in a rotating barrel this is not important as the moving parts are both coloured and relieved at the same time. Brushing or swabbing is a method used for large 'in situ' articles such as window frames, statues, door frames etc. and other similar objects. The solutions used for this type of application are gel thickened and are mildly acidic and/or corrosive in nature and any containers must be of an acid resistant material (plastic). Polypropylene, polyethylene or PVC tanks are perfect. Brushes made with polyester or natural bristle will suffice (Nylon is useless with acid). Mopping or swabbing will give a more even flow than brushes and most if not all synthetic sponges these days are made from polyester foam.

With certain exceptions, the Antiquing Fluid Immersion processes are always used by dilution, generally in the order of from 5 to 10%, There is no advantage in using then any stronger to obtain quicker results as a fast reaction will produce a soft powdery columnar structure which will lack adhesion and render the coating too easily rubbed off. A slow reaction lays down a hard resilient film, which will not come off. The film cures to its hardest state after drying at which point the surface will appear dry, dull and possibly powdery; the colour is re-achieved after the lacquering or waxing. The process goes through a range of colour effects before the desired effect is achieved. At this point the components are removed from the solution and thoroughly swilled to halt the reaction. Experimentation will determine the time taken to achieve this and the process cycle can be set accordingly to ensure each batch is uniform. When the time taken to reach the colour starts to extend, this will determine whether the solution requires replacement or replenishment. Generally, the reaction times are in the order of minutes, so constant attendance is not required.

A variation to the preferred techniques explained here applies in the case of treatments on bimetal components; these are assembled articles such as polished door furniture (hinged letterboxes etc.) where exposed mild steel or zinc components are evident. A bimetal or galvanic reaction will occur which will affect the patination pattern on the reverse side of article where the other metal is affixed to the brass. This is because when the component is immersed in an acidic solution, a potential is generated between the two metals. The mild steel or the zinc will act as the positive and the brass the negative electrode. In such cases, the only method of overcoming this is to

warm the components assembled in work trays with a hot air source (such as an electric paint stripper gun - never use a flame source) and apply the antiqueing solution with a brushing technique. When 'relieving back' is to be carried out, this MUST be done whilst the work is in the wet state. This is so as to avoid brushing the metallic oxide dust into the air. The dried deposit is a metallic compound and must be considered as toxic and should not be inhaled. When 'relieving' in the wet state, the oxide remains on the surface until safely swilled off.

Post Treatment:

The final treatment is the lacquering (or waxing - see separate note) and is best carried out using a suitably thinned air drying or storing lacquer. We recommend the use of Liberon Jade Oil for application to Antiquing Fluid colouring processes. For waxed finishes, beeswax, carnauba or waxes combining these two natural wax ingredients are used. These are extremely hard and resilient waxes and will usually give prolonged atmospheric protection for many years if applied correctly. Many domestic furniture waxes are based upon these products if waxes are prepared especially using these ingredients, a turpentine softening base is best used as this will allow a smooth thin application of the wax to the treated surface. By allowing the wax to cold dry before buffing the surface, further applications can be applied which will gradually deepen and enhance the antique effect. It is inadvisable to apply waxes too thickly initially, as it becomes difficult to polish out the wax lines when it has dried to its natural hard state. Whether therefore the choice is lacquering or waxing (statues, memorials etc.) Either way, some form of post treatment is necessary as the finishes provided-by the Antiquing Fluid processes are not designed to impart corrosion or excessive abrasion resistant characteristics.

For small items which are meant for Interior decorative uses, household waxes can safely be used. Certain products these days are supplied in spray form; these products are wax emulsions in a solvent base and are quite acceptable. However, when using these products, allow the wax film to dry onto the surface before buffing or the base antique oxide film will be 'dragged' and damaged. However, owing to the manner in which spray waxes are applied, unevenness can occur which will effect the overall uniformity of the finish. In these cases, the hard household tinned wax polished applied by cloth or brush is usually far more effective. The recommendations given here for solvent based wax emulsions specifically precludes the use of chlorinated solvent based wax emulsions such as are used on marble or polished stonework as these may initiate reaction with atmospheric water vapour to form hydrochloric residues and so damage the oxide film (see note iv below). The turpentine/natural wax-based emulsions as described above will not cause this problem.

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