Permalac
A Superior Protective Coating for Steel, Copper, Brass, Patina, Concrete, Wood

“It's the best inside-outside paint that I have used in the past thirty years” – Michael F. Keegan, Contractor, Atlantic City, NJ

USES

Permalac can be used on both exterior and interior copper, brass and bronze surfaces such as architectural and automotive trim, builders’ and marine hardware, bank building hardware, quality lighting fixtures, bronze plaques, steel signage, wood signage, hardwood floors, terracotta items etc.

Permalac makes an excellent coating to seal and preserve various proprietary oxidizing and coloring processes that are used for antique patina and smutting effects.

GENERAL DESCRIPTION

Permalac is a glossy, crystal clear, durable, air-drying coating that was initially formulated for application on copper, brass and bronze. Since then, Permalac has now been used on and proven to be a good sealer for steel, wood, terracotta and concrete.

Permalac provides unusual under-film tarnish protection as well as superior resistance to ultra-violet light, and remarkable resistance to salt air atmosphere.

FILM LIFE

Permalac should give satisfactory exterior protection for at least ten years under normal conditions. Considerably longer life is expected.
EASE OF REMOVAL

Should refinishing be required, the coating can be removed easily by conventional lacquer stripping techniques.

SUGGESTED CLEANING AND FINISHING PROCEDURES

Most failures of clear coatings over copper, brass, bronze, and steel are not due to the failure of the coating itself but rather to progressive staining and tarnishing of the metal underneath.

SURFACE PREPARATION

The life of a coating depends greatly upon the preparation of the receiving surface. The following suggested metal finishing procedures are believed to be the best presently available and should assure a long life for the coating. Your present cleaning and finishing process may be adequate, or even better than our suggestion, for your purposes. We list these procedures as they may be of value in solving a problem.

Degreasing and Cleaning Solvents

For Shop Refinishing: A good grade of inhibited Trichloroethylene.
For field refinishing: Cleaning Thinner #500
Surface Cleaner: Cleaning Thinner # 69

PRODUCING A SATIN FINISH IN THE SHOP

New metal should be evenly abraded by belt sanding, strapping, grinding etc., for the rough satin finish. The metal should be then “dressed” with clean silicon carbide pads such as “Scotch-Brite” (3M Co.) and a suspension of powdered pumice in cleaning thinner #69. This produces a fine satin finish. Metal polishing compounds should not be used as they may contain other contaminants that are difficult to remove.

The metal is then washed with cleaning thinner # 69 and wiped dry with clean cotton waste. At least two applications of cleaning thinner #69 should be made. If any dirt is found on the waste, the cleaning step should be repeated. Note: Complete evaporation of the #69 thinner before it can wiped dry may cause streaking. In finishing large sections where this can be a problem, thinner # 500 should be used instead of #69.

PRODUCING A HIGHLY POLISHED FINISH

Finishing a new metal to a highly polished mirror finish in an in-shop operation may be carried out by conventional buffing and coloring techniques. Following the final coloring buff, the metal should be degreased and cleaned as noted above using soft cotton pads instead of white cotton waste.
REFINISHING

Remove all existing lacquer residues by generously applying the stripper on all metal areas containing it. Follow the directions and all safety precautions prescribed by the lacquer stripper manufacturer. Note: In some instances, it may be necessary to use a brass wire to loosen stubborn old lacquer film. When this is done, brush strokes should follow the direction of the grain and care should be taken to avoid scratching the surface.

When all the lacquer has been removed, washed the metal thoroughly with clean water and wipe dry with cotton waste leaving no trace of the lacquer remover or residue. Dry the metal thoroughly with clean cotton waste.

Remove all stains (oxides, sulfides, or corrosion products) by using an abrasive such as aqueous slurry of 5% oxalic acid and powdered pumice. The slurry should be rubbed with the grain of the metal until all stains are removed. Stainless steel wool, bronze wool, or scotch-brite (3M pads) can be used for rubbing. Ordinary steel wools should be avoided as many have been treated with amino-type inhibitors which may stain copper and brass surfaces. Hand rubbing can be substantially reduced by the use of power equipment. The acid-pumice slurry should be thoroughly rinsed from the metal surface with lots of distilled water and then wiped dry with clean cotton waste. Commercial metal cleaner should not be used because of the possibility of introducing harmful residues. The metal should be “dressed” and cleaned as described above.

The application of Permalac should promptly follow the final cleaning. Avoid handling of the cleaned metal prior to the application and drying of Permalac.

APPLICATION

Spray application is the usual method, although brushing, flow coating, roller coating etc., may be used. Small parts may be coated with Ronci, or comparable equipment. Any dust collected on the cleaned metal should be blown or wiped off with a clean cloth before Permalac is applied. Permalac is applied in full coats.

DRYING TIME

Air dries to the touch in less than 5 minutes; may be forced dried faster at 250°F. Air dries hard in an hour or so, depending on coating thickness, temperature, etc.

REDUCING

Brush – Ready to use to obtain a level, smooth seal.
Spray – Thin Permalac with #281 thinner, as needed. We recommend 4 parts of Permalac to 1 part #281 thinner. Make sure that the spray equipment is clean.

Note: In some instances, for example on hot and humid days, the fast drying Permalac can trap moisture underneath the seal. This trapped moisture will manifest itself as a
“cloudy” coating. Such cloudy coatings can be prevented by the addition of the slow
drying #69 thinner, or an even slower #500 slo-dry thinner.

**DRY FILM PHYSICAL CHARACTERISTICS**

For optimal protection, the dried film should have a thickness of 0.5-0.75 mils (ASTM D-1400)

Adhesion: The dried film should pass the crosshatching and scotch tape adhesion test 100%.

Hardness: Pencil hardness test rating is approximately “H”.

Flexibility: The dried film should pass bending on a 3/16 inch diameter mandrel
(Federal Method 6223, part of Federal Method 141a).

Chemical Resistance: (10 is no change, 0 is failure)

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1% TSP (Trisodium Phosphate) (24 Hours)</td>
<td>10</td>
</tr>
<tr>
<td>1% Tide (24 Hours)</td>
<td>10</td>
</tr>
<tr>
<td>Synthetic Perspiration (24 Hours)</td>
<td>10</td>
</tr>
<tr>
<td>50% Alcohol (1 Hour)</td>
<td>6</td>
</tr>
<tr>
<td>10% Ammonia (1 Hour)</td>
<td>7</td>
</tr>
<tr>
<td>0.5% Ammonium Sulfide Solution (1 Hour)</td>
<td>9</td>
</tr>
<tr>
<td>Boiling Water (20 Minutes)</td>
<td>6</td>
</tr>
<tr>
<td>Gasoline (To Evaporation)</td>
<td>9</td>
</tr>
</tbody>
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Abrasion Resistance: Weight loss, 500 cycles: 31 milligrams (Taber Abrader)
(Federal Method 6192)

Gloss: (60° on copper alloy #110) – 95

**PERFORMANCE TESTS**

Kitchen Dishwasher: With Electrosol
25 Cycles: No change in appearance.
50 Cycles: Some spotting and pitting. No significant change in
gloss, adhesion, and hardness.

Accelerated Indoor Heat Aging: (6 weeks at 158°F)
No significant change.

Thermal Cycling: (10 cycles 350°F to 10°F)
No significant change.
Salt Exposure: (300 hours)

(A variation of DIN #50021) Panels were immersed in 5% NaCl solution at 40 C at an angle of 60-75 degrees from the horizontal. No significant change in the coating and practically no corrosion creep at scribed X after 300 hours.

Weathermeter: (900 hours)

No significant change in the coating except decrease in gloss.

Outdoor Exposure: Bronze Statue of Kansas Jayhawks in Lawrence, KS. More than 5 years of exposure. No significant change in appearance.

DISCLAIMER

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