

PERMALAC LAQUER TECHNICAL INFORMATION AND USES

Overview:

PERMALAC is a crystal clear, durable, air-dry coating. It can be used on exterior copper, brass and bronze surfaces to protect special architectural coatings and automotive (or motorcycle) trim. Contractors and manufacturers have had successful results applying it to builders' and marine hardware, lighting fixtures, bronze plaques, and steel signage.

PERMALAC provides unusual under-film tarnish protection as well as superior resistance to ultra-violet light, and remarkable resistance to salt air atmosphere. Sculptors and artisans who fabricate custom designed fences from forged steel have found PERMALAC to be especially effective as a sealant for certain proprietary oxidizing coloring processes that are used to create antique patina and smutting effects.



PERMALAC should give satisfactory exterior protection for at least ten years under normal conditions. Considerably longer life is expected.

Surface Preparation

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

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.

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 be 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.

Ease Of Removal

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

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 2500° 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 slow-dry thinner.

Dry Film Physical Characteristics

- For optimal protection, the dried film should have a thickness of 0.5-0.75 mils (ASTM D1400)
- 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)

- 1% TSP (Trisodium Phosphate) (24 Hours) 10
- 1% Tide (24 Hours) 10
- Synthetic Perspiration (24 Hours) 10
- 50% Alcohol (1 Hour) 6
- 10% Ammonia (1 Hour) 7
- 0.5% Ammonium Sulfide Solution (1 Hour) 9
- Boiling Water (20 Minutes) 6
- Gasoline (To Evaporation) 9

Abrasion Resistance:

- Weight loss, 500 cycles: 31 milligrams (Taber Abrader)
- (Federal Method 6192)
- Gloss: (600 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 1580° F)

- No significant change.

Thermal Cycling: (10 cycles 3500° F to 100° 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:



"Jayhawk" by sculptor, Elden Tefft of Lawrence, KS, being reset on its base following repairs and refurbishment.

- Bronze statue, University of Kansas at Lawrence. Coated with PERMALAC. More than 5 years of exposure. No significant change in appearance.

Disclaimer:

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Independent Test Results*

Salt Fog Testing:

The PERMALAC used in the salt fog testing was diluted with Toluene at ratios of 3,4, and 5 parts toluene to 1 part PERMALAC. After 72 hours of testing with many samples of each, the results are as follows:

- No noticeable visual degradation.
- No noticeable visual degradation when viewed under a microscope.
- An average of 5% degradation of the 3 to 1 and 4 to 1 concentrations when tested before and after using an infrared spectrometer in the range of 2 to 12 microns.
- No degradation of the 5 to 1 concentration using the same infrared reflectance test.
- No change in RF reflectance or transmission values after the salt fog testing.

UV Testing:

PERMALAC was diluted the same as in the salt fog testing. Many samples of each concentration have been tested and subjected to 40+ hours of intense UV light (1100+ W/M²). Results are as follows:

- No noticeable visual degradation.
- No noticeable visual degradation when viewed under a microscope.
- No reduction in IR reflectance values when tested before and after using an infrared spectrometer.
- No change in RF reflectance or transmission values after the UV testing.
- No Visual discoloration.

Adhesion Testing:

The adhesions tests performed on the PERMALAC were done according to the cross-hatch tape test outlined by Sherwin-Williams Paints. The results of the adhesion test are as follows:

- The PERMALAC in all concentrations passed with an excellent rating in all adhesion tests conducted. (The substrates the PERMALAC was applied on for our testing were aluminum and urethane.)

Architectural Coatings

PERMALAC has proven a breakthrough solution for a variety of architectural coatings. It has enabled designers, architects and interior decorators to experiment with patinas and other special finishes and stabilize them as never before.

Recently, a well-known movie star wanted all the exterior metal components in her New York City condominium finished with a special nickel silver metal. The custom compound was prepared by PermanOre Architectural Finishes, Inc. of Milford, NJ. It mixed a granular powder with a polymer resin binder. Once sprayed and cured, the compound could be sanded and polished and given the oxide appearance of her specifications. To set it and maintain this "look" against the elements, the contractor sprayed all exposed parts with PERMALAC.

PERMALAC can also be used on a number of other substrates from terra cotta to signs made of polyurethane foam. One interior decorator created a theatrical proscenium curtain in cloth, sprayed in with a copper powder mixed with resin and to maintain the appearance of the now solid drapery, finished it with a coating of PERMALAC.









This New Jersey monument was commissioned to honor one of the rescue chiefs at ground zero and is dedicated to the memory of 9/11. The statue is four feet tall and sits on top of a exterior fountain structure. The substrate is solid concrete with an interior water tube that jets water from the fire hose when the fountain is in operation. After being cast in a two-piece mold, the sculpture was coated with a metal composite containing 95% granulated Bronze and 5% polymer resin binder. A statuary patina highlighting the dominant features was then added to give the monument the aged look that naturally occurs with bronze statues over the years. The final step was assuring the protection of the finish with a coating of Permalac.



This pot is 18" high and 18" in diameter. It is cast in concrete in a two-piece mold. The copper and bronze finishes are applied to give the piece its antique patina and highlighting. To protect the container's delicate finish from the elements, it is coated with Permalac.





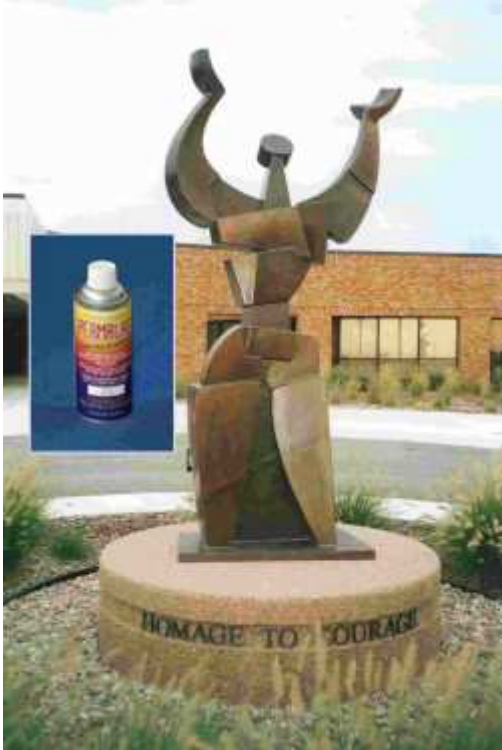
Outdoor Art

PERMALAC: The art of survival

The powerful bronze sculptures created by Kansas sculptor Jim Bass are representations of his concepts, design ideas, and skill. Moreover because they are created in the present, they represent life and culture at this time in history, the same way the marble sculpture of the ancient Greeks represented their era. Clearly it is important that they be protected in order to last for years to come.

However when Bass's welded bronze pieces are continuously exposed to the blazing summer sun, freezing winters, driving winds and acid rain, there can be significant problems conserving the artwork's original appearance. Problems that Mr. Bass and hundreds of other sculptors across the country are solving with PERMALAC, the technical coating from Peacock Laboratories in Philadelphia, PA.

PERMALAC is a glossy, crystal clear, durable lacquer that can be sprayed on steel, aluminum, copper, silver and bronze as well as steel, terracotta and concrete. It contains UV and corrosion inhibitors that protect outdoor sculptures and other coated surfaces for a minimum of 10 years. Once applied, PERMALAC air dries to the touch in less than 5 minutes and dries hard to a highly durable finish in an hour or so, depending on the film thickness, temperature etc.



*"Homage to Courage" by sculptor
Jim Bass of Kansas*



*"Outdoor Bench.
Sculptor: Betty Woodman - New York City"*

Mr. Bass is renowned throughout the Midwest for his striking heroic conceptions that anchor and identify many public spaces. His "Homage to Courage" was installed at the Nebraska Law Enforcement Training Center in Grand Island Nebraska several years ago. "When I heard about PERMALAC I decided to try it. It lasts a lot longer than any other coating I've tried. Here in Nebraska, it can blow pretty hard, but I haven't seen any evidence of coating failure." Mr. Bass said.

Decorative

Ironwork

PERMALAC clear coat exterior lacquer from Peacock Laboratories on ironwork provides long-term protection

Until recently Ivan Ananyev's shop in Phoenix Arizona had been experimenting with a variety of clear coat lacquers, each of which claimed they'd stand up to the elements; a claim they kept for a year at the most. Sooner or later, generally sooner, the weather would break through and the systematic destruction of the patina so integral to the look of Ivan's ironwork would begin.

That changed two years ago when Ivan discovered PERMALAC from Peacock Laboratories in Philadelphia. This product enhances the look of Ivan's work the minute the spray coat has cured. Once installed, work protected by PERMALAC stays protected. In fact, Ivan now guaranteed the finish of his work for ten years. Ivan's partner, Terry Ebeling says the company now averages twelve major installations a year.

Ivan learned about harsh environments and the destructive effect they can have on human structures in Siberia. That's where he grew up and learned

the trade of blacksmithing. Twelve years ago he left the frozen steppes to continue his trade. Working for others, his reputation grew quickly and five years ago he opened his own company, Integrity Ironworks, LLC. Today he is respected throughout the state and beyond for the exceptional quality of his work and the unique creativity of his imagination.

PERMALAC air dries to the touch in less than 5 minutes and dries hard to a highly durable finish in an hour or so, depending on the film thickness, temperature etc. It can be used on many exterior surfaces including steel, aluminum, copper, silver, bronze, wood, terracotta and concrete. The product is available in 12-ounce spray cans.







Marine

PERMALAC clear coat exterior lacquer from Peacock Laboratories has been welcomed aboard a number of challenging marine applications. The ability of this long lasting, super hard, impenetrable exterior finish coating to withstand the elements at sea -- UV, salt spray, wind borne abrasives, etc. makes it a natural. Moreover, users experience consistently confirms PERMALAC's reliability in all manner of extreme weather conditions.

PermanOre Architectural Finishes, Inc., a Milford, NJ company specializing in metallic architectural finishes for a variety of substrates, uses PERMALAC to protect the restoration marine hardware it finishes. Recently the company completed a contract to finish new port lights to exactly match the port lights on a 1941 Burger Flat Deck Cruiser.

The boat was originally built as a pleasure craft, however shortly after completion it was requisitioned by the U.S. Navy. At the time, civilian craft were the only boats afloat not being attacked and sunk by German submarines. After the war the navy offered to make any improvements the original owner wanted, so he asked them to make the 65' craft 75'. And they did!

Recently the boat was purchased and a complete restoration ordered. The owner wanted to double the number of circular port lights (windows) but he wanted the new lights to match the original 1941 lights. To achieve this, new lights were cast in bronze and then sprayed with a coating that compounded 95% powdered aluminum with a special hybrid polymer resin solution binder and catalyst. Once laid down this PermanOre coating functions the same way as real metal. It can be sanded, sandblasted, polished, ground, machined, or engraved in the same manner as the actual metal.





The final step was spraying the finished lights with PERMALAC. Aside from protecting the carefully finished metal surface, PERMALAC has the advantage of being invisible. Unlike other lacquers it doesn't give architectural coatings a plastic coated appearance and sheen. In addition to the lights PermanOre (www.permanore.com) also prepared and applied brass coatings for all exterior metal work from the windshield wipers to the anchor. These also were final coated with PERMALAC.