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PAINTS FOR SWIMMING POOLS

There are few structures more difficult to decorate with a reasonably permanent paint coating than a concrete swimming pool.

Preparation of Surface.— Of primary importance for the life of any coating is the proper preparation of the surface to be painted. Nothing is more likely to prevent proper adhesion of any kind of paint than oil or greasy dirt on the surface being painted. Such deposits on new concrete can be removed by scrubbing with soap and water. A good washing solution can be made with equal weights of soap chips and trisodium phosphate. Three ounces of this mixture dissolved in a gallon of hot water is efficient in removing dirt, oil and grease.

Acid Etching.— New concrete surfaces of swimming pools, after being cured properly, should be etched with a 20 percent solution of muriatic acid (one quart of concentrated muriatic acid to a gallon of water. This statement applies to the varnish paints and particularly to the rubber-base paints to be described later on. It also applies to cement-water paints, if the concrete surface is glazed or contains efflorescence. The acid should be applied with a brush. After about five minutes, the surface should be brushed vigorously with a stiff bristle brush to remove efflorescence. If necessary a stronger solution of acid may be used. It is advisable to complete the operation on a rather small area at one time, so that the acid solution may be worked properly, and the solution washed off before it penetrates too deeply. After brushing, the surfaces should be washed off promptly and thoroughly with water under pressure. The washing must be sufficiently thorough to remove all trace of any soapy or greasy feeling on the concrete surfaces after drying. Every precaution should be taken to insure etching of the entire surface to be painted. Painting should follow as soon as the etched surface is dry (except for the cement-water paint), so that no efflorescence is permitted to form.

A pool that has been previously painted is generally more difficult to clean than a new one. If it is known that the old paint is the same as the one to be applied, it may be only necessary to thoroughly remove all paint that is in any way damaged, thoroughly clean up the whole surface by washing with soap solution and rinsing with clean water and treat it like a new clean surface. If a rubber-base paint is to be used, experience indicates that the safest plan is to remove all the old paint.

Types of Paint.- Replies to a questionnaire sent by the Bureau in July 1940 to a limited number of producers and users of swimming pool paints, indicate that these are generally of three types (each type of paint is generally applied in two coats):

(a) Cement-Water Paints.

(b) Enamel paints with water-resisting varnish vehicle.

(c) "Water-proof" enamel paints.

(a) Cement-water paints are furnished in dry powder form to be mixed with water for application. Federal Specification TT-P-21, Type II, Class A, "Paint; Cement-Water, Powder, White and Light Tints (For Interior and Exterior Use)" includes this type of material. This specification can be purchased from the Superintendent of Documents, Washington, D. C., for 5 cents (do not send stamps). These paints require moisture for hardening. If the mixing water evaporates too rapidly, the hydration of the cement remains incomplete and the resulting coating will powder off gradually. It is therefore very important that the paint be applied on the wet surface and that it be kept moist until it fully hardens. Cement-water paints can be procured in a variety of colors including white, ivory, gray, cream, light green, etc. It is generally recommended that tinted cement-water paints be applied to concrete surfaces only after they have aged several months. The advantages of the cement-water paints are ease of application and low cost. Their disadvantages are ease of absorbing body oils and grease, aggravation of algae trouble where it exists, and a somewhat rough finish which is not easy on bathers feet. One season is probably the maximum period that a much used pool can be kept in good condition without repainting.

(b) The enamel paints with water-resisting varnish vehicles were probably made with vehicles containing tung oil and often some phenolic resin. These vehicles, while not identical with, are similar to spar varnish (Federal Specification TT-V-121b). These enamels must be applied to the clean, dry pool, which must be kept dry for a considerable time (several days) after each coat is applied. They give smooth, attractive surfaces and may last for possibly a single season; but may develop blisters and peeling in that time.

(c) The "water-proof" enamel paints that were successfully used on a large number of swimming pools more than five years ago were probably made with varnish vehicles, the nonvolatile portion being mainly chlorinated rubber or other rubber derivatives, and plasticizers. Tung oil was probably one of the best plasticizers, and since both rubber and tung oil have been unavailable since December 1943, it may be that the stocks

of these paints are quite low at this time. When the war is over, these rubber-base paints or modifications of them, as well as polyvinyl chloride and possibly other synthetic vehicle paints undoubtedly will be used again. The exact formulations were generally not revealed but several producers furnished satisfactory products. The colors of the paints offered by one of the producers included white, black, sky blue, light blue, medium blue, dark blue, sea green and vermilion. Other producers offered also a wide range of good colors. The most popular colors for the interior of the pool are sky blue, sea green and white.

Information concerning chlorinated rubber and other rubber derivatives, and possibly names of paint manufacturers who have made "water-proof" paints of this kind, can probably be obtained from the Hercules Powder Company, Wilmington, Delaware; the Goodyear Tire and Rubber Company, Akron, Ohio; R. T. Vanderbilt Company, 230 Park Avenue, New York City; and Chadeloid Chemical Company, 70 East 45th Street, New York City.

Some of the finest swimming pools have for many years been lined with various colored vitreous tile, instead of paint.

Toxicity of Paints.- The U. S. Public Health Service, Washington 25, D. C., has looked into the construction and operation or maintenance of swimming pools. Questions concerning the toxicity of various paints and pigments for swimming pools should be referred to that agency.

References.- Attention is called to an official report (1942) by the American Public Health Association, 1790 Broadway, New York City, entitled "Recommended Practice for Design, Equipment and Operation of Swimming Pools and Other Public Bathing Places".

The Portland Cement Association, 33 West Grand Avenue, Chicago, Illinois, will give information on the design, construction and operation of concrete swimming pool projects.

