

LEAD INDUSTRIES ASSOCIATION

80 EAST 42ND STREET

NEW YORK 17, N. Y.

May 5, 1959

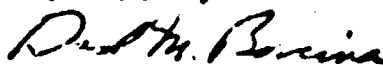
SUBJECT: Lead Pigments
Technical Letter No. 14

To Members of the Lead Pigments Technical Committee:

We are pleased to attach a rough draft of Lead Pigments Technical Letter No. 14 - L.I.A. Formula 328 - A Red Lead-Coumarone Primer for Seawater Immersion.

It is our plan to have the text included in the "Letter" cleared by the Navy Department on a visit to Washington the latter part of May. For this reason could you let me have your comments and suggested revisions no later than May 18, 1959.

Very truly yours,



David M. Borcia
Secretary, Lead Pigments Technical Comm.



Proposed Copy for
Lead Pigments Technical Letter No. 14

L. I. A. FORMULA 328
A RED LEAD-COUMARONE PRIMER

for

SEAWATER IMMERSION

FOREWORD

IN 1948 the Navy initiated a series of tests comparing anticorrosive paints and primers for ship hulls. After a thorough preliminary screening, some of these paints were given full-scale "service tests" under the continuing Navy program designed to find and develop new coatings with improved service potential and economy. These service tests, carried out on the hulls of three U. S. Destroyers, were recently completed. On the basis of test results, red lead-coumarone primer (L.I.A. #328) appears to have performed comparably to the more expensive #14N coating which is the Navy standard for ship bottom service.

On one of the three ship bottoms, the red lead primer was judged to be "slightly inferior" (average merit score of 93.8 vs 95.5). In a second case the shipyard found "no significant difference in performance" between red lead primer and #14N. And in the third case it was found that the red lead primer "affords protection that is equal or very slightly better than Navy standard anticorrosive #14N."

This type of primer should be applied to thoroughly cleaned surfaces for best performance. In these tests, the bottoms were sandblasted to bare metal. A slight improvement in overall performance was noted when the bare surface was prepared with USN #117 surface preparatory coating before priming.

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Additional information on this paint formulation or other specific paint problems can be obtained from the Lead Industries Association or from the designated individuals in the member companies listed below.

Manufacturers of Red Lead

(List of Companies)

RED LEAD-CAMBRIDGE PRIMER

FOR SEAWATER IMMERSION

BASICALLY, the coating system described here consists of a red lead anticorrosive primer and a finish coating of either hot or cold plastic. For best performance of the coating, surfaces must be thoroughly cleaned and dry at the time of application. Sandblasting to the bare metal before painting is recommended.

While a metal conditioning coating prior to priming is not mandatory, there is some evidence that performance of the coating system is slightly improved when the bare metal is so treated. A pigmented metal preparatory coating (U. S. Navy Bureau of Ships Formula No. 117 — the formula is available from the Bureau of Supplies and Accounts, Washington 25, D. C.) was applied in a thickness of 0.3 to 0.5 mils in the tests on three U. S. Destroyer hulls. As the name implies, the surface preparatory coating is intended to condition the metal surface and insure a firm bond between it and subsequent coats of paint.

Where no metal conditioner is used, the red lead primer is applied directly over the clean, dry metal surface. In either case multiple coats of the primer should be applied to reach a minimum dry film thickness of 3 mils. The test results reported for the three destroyers are based on

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heavy coats which built up a film thickness of 5 to 5.8 mils of primer in two or three applications by brush. In applying the primer, a minimum drying period of six hours between coats and six hours before the finish coating should be allowed.

A variety of antifouling coatings are in current use for ship bottoms and similar service. Cold plastic coating No. 105 and Hot plastic No. 15 NPS were used in Navy tests. Others include Maritime Commission SZ-MC-403 and Bureau of Ships Formula No. 121.

FORMULATION OF LIA # 328

RED LEAD-COUMARONE PRIMER¹

Composition	Percent	Pounds	Gallons
PIGMENT: Red Lead (97% grade).....	47.0	332	4.51
Zinc Oxide.....	8.3	58.1	1.24
Zinc Yellow.....	8.8	62.2	2.08
Mica (325 Mesh).....	8.3	58.1	2.46
Magnesium Silicate.....	27.2	192	8.07
Aluminum Stearate.....	0.4	3.1	0.37
	100.0		

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VEHICLE: Coumarone-Indene Resin	³		
(M.R. 127-137°C)	25.4	166	18.12
Coumarone-Indene Resin (M.R. 5-15°C)	8.7	57	6.22
Liquid Coal Tar (Navy Dept. Spec. 5275a)	8.9	58.1	5.87
Zinc Resinate.....	3.2	20.8	2.17
Chlorinated Rubber.....	6.3	41.5	3.03
Ki-Flash Naphtha.....	11.7	208	28.50
Aliphatic Petroleum Spirits			
(B.R. 105-260°F)	15.0	98.5	16.69
Pine Oil.....	0.8	5.2	0.67
	100.0	100.0	100.00

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Pigment - 51.9%

Vehicle - 48.1%

Wt./Gal. - 13.6 lbs.

TV - 35%

- 1) First described in Red Lead Technical Letter No. 5, July 1950 as "Formula 5-2" (out of print).
- 2) This vehicle may be prepared by heating the coumarone resins and liquid coal tar together to a temperature of 445°F , adding the zinc resinate and holding temperature until it is all melted in. All of the petroleum spirits and 80 gallons of the required Hi-Flash naphtha may then be added. The chlorinated rubber can then be dissolved into the remaining Hi-Flash naphtha at room temperature. The chlorinated rubber should be blended in with the remainder of the ingredients only after the coumarone-coal tar-resinate mixture has cooled to 110°F or less. To avoid decomposition, the chlorinated rubber should never be heated above 110°F .
Although the above method is preferred, the vehicle may also be prepared by cold cutting the indicated ingredients.
- 3) A coumarone-indene resin with a melting range of $127-137^{\circ}\text{C}$.
- 4) A coumarone-indene resin with a melting range of $5-15^{\circ}\text{C}$.

Note: Only dark colored finishes should be applied over this primer since bleeding through of the coal tar may occur. However this does not affect its protective performance.

In applying these paints in confined areas, adequate ventilation is necessary to prevent accumulation of explosive vapors and to protect the operator.

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Although the formulations contained in this Technical Letter have been established by our Lead Pigment Technical Committee through careful evaluation, no guarantee of results is made or implied. Users are urged to make additional confirmatory evaluations to meet their specific requirements.

The Lead Industries Association and its member companies will be glad to give further information on paints for marine exposures or to assist on other paint problems.

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