LEAD INDUSTRIES ASSOCIATION

420 LEXINGTON AVENUE
NEW YORK 17, N. Y.

Pigments and Chemicals Division

May 25, 1953

SUBJECT: L. I. A. - NAVY COOPERATIVE TESTS

To Members of the Pigments and Chemicals Division:

The enclosed excerpts from the final report on the L. I. A. - NAVY COOPERATIVE TEST on shipbottom primers and the enclosed letter of transmittal from the Bureau of Ships will bring you up-to-date on one phase of our work with the United States Navy.

The panels in this test, containing 37 paint systems, were immersed in sea water at five exposure sites along the Atlantic Coast for 41 months. The results show that three paint systems containing red lead-vinyl primers gave outstanding performance. A red lead-coumarone primer also received very high ratings. The system receiving the top rating of 95.1 contained a lead chromate metal conditioner and a red lead-vinyl anticorrosive primer.

Very truly yours,

C. J. Vander Valk,
Technical Director

N2823

CONFIDENTIAL

DEPARTMENT OF THE NAVY

BUREAU OF SHIPS

WASHINGTON 25, D. C.

IN REPLY REFER TO
S19/1-1(347)
Ser 347-461

Lead Industries Association
Graybar Building
420 Lexington Avenue
New York, New York

14 APR 1953

Attention Mr. C. J. Vander Valk

Gentlemen:

The final report has been received from the Norfolk Naval Shipyard which covers the cooperative test with your Association and member firms on shipbottom primers.

A copy of the report is enclosed for your information. The results of test or the fact that the test was conducted shall not be used for advertising purposes or for the dissemination of information leading to use by other than the Federal Government.

It will be noted that a considerable degree of implementation has already been authorized by the Bureau to carry out confirmatory shipboard tests of the report's findings.

Please convey to all in your Association who were involved the thanks of the Bureau for their sustained interest in this cooperative investigation.

Sincerely yours,

Encl:
(1) Norfolk Report No. 568

s/ Daniel P. Graham

D. P. Graham
Head, Coatings and Preservation Branch
By Direction

EXCERPTS FROM
FINAL REPORT

ON

SHIPBOTTOM PRIMERS - COOPERATIVE TEST WITH

LEAD INDUSTRIES ASSOCIATION AND MEMBER FIRMS

Navy Project: NS-061-002 (Formerly NS-061-006) Norfolk Test Serial No. 568

15 Jan 1953

Paint Laboratory
Norfolk Naval Shipyard

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6. CONCLUSIONS:

a. Based on the results of this test the following conclusions are made:

(1) Three of the 37 shipbottom painting systems showed outstanding performance in resisting deterioration and were superior to the others, including the Navy standard cold plastic and hot plastic systems. These systems were #15, #12 and #14 and were straight vinyl systems.

(2) Three other systems, #37, #7 and #8 showed good performance and appeared to be about equally effective in this respect but they were slightly inferior to the three vinyl systems. The systems included the Navy standard hot plastic system and the L.I.A. 328 anticorrosive/Navy cold plastic antifouling system.

(3) The vinyl systems showed a tendency to allow severe pitting of the painted steel occur where the protective paint film breaks.

(4) The "wash primer" pretreatment is in general more beneficial to the paint system than the Navy phosphoric acid pretreatment.

(5) There is little to choose between the type of "wash primer" containing zinc chromate (L.I.A. 306) in the one case and lead chromate (L.I.A. 339) in the other case.

(6) Two coats of Navy 105 antifouling were equivalent to four coats of vinyl antifouling (L.I.A. 337) in film thickness.

(7) The antifouling properties of Navy 105 were slightly superior to the vinyl antifouling paints (L.I.A. 337).

(8) The vinyl anticorrosive paints required four coats to obtain the desired film thickness while most of the oleo-resinous types of anticorrosive required only two coats.

(9) Red lead or red lead mixed pigment anticorrosive primers in a vinyl resin vehicle or a resinous vehicle such as a coumarone-indene-coal tar-chlorinated rubber showed very good performance.

(10) Red lead mixed pigment primers made with vehicle blends of alkyd resin-phenolic resin varnish showed very poor performance.

(11) System 35 (having a hot plastic anticorrosive undercoat) and System 37 (having a hot plastic antifouling topcoat) did not show quite as good performance as the best vinyl systems, but gave considerably greater total coating thickness in fewer coats of paint as compared with the other systems and have the advantage of lower application cost.

7. RECOMMENDATIONS:

a. It is recommended that:

(1) One of the vinyl shipbottom paint systems (#15, #12 or #14) should be given a thorough service test evaluation by "quartering" a number of active ships with the vinyl paint system and the standard hot plastic system. This part of the vinyl paint testing program has already been practically accomplished by the Bureau of Ships during the past year, since approximately 23 vessels have received vinyl paint (System 14) at Norfolk Naval Shipyard, and a number of similar vinyl paint applications have been made by the Mare Island and Philadelphia Naval Shipyards.

(2) Two non-vinyl anticorrosive systems, i.e. System 7 (L.T.A. 328) and System 35 (Norfolk hot plastic anticorrosive) should be service tested on several vessels at Norfolk. The Bureau of Ships has already authorized these service evaluations by S19/1(533) Ser 533-2188 of 5 Aug. 1952. Norfolk will proceed with the tests as soon as the experimental paints can be made.

(3) Norfolk should be permitted to proceed with service testing of the experimental hot plastic anticorrosive on the basis of the new improved Formula 147-100 developed by modification of Formula 147-85 to improve the cracking resistance and adhesion properties which were somewhat deficient in this test.

Paint Systems Listed in Descending Order of Merit According to Final Spe (Protective Value) Rating

System No.	Pretreatment	Anticorrosive	Antifouling	Spe Rating
15	L.I.A. 339	L.I.A. 326	L.I.A. 337	95.1
12	L.I.A. 306	L.I.A. 336	"	93.5
14	L.I.A. 306	L.I.A. 326	"	93.2
13	L.I.A. 339	L.I.A. 336	"	89.6
37	eNP	Navy 14	Navy 15NP	85
7	NP	L.I.A. 328	Navy 105	81.7
8	L.I.A. 306	L.I.A. 323	"	81
35	NP	Mfr. 1147-85	"	77.6
23	L.I.A. 306	PM-1-20	L.I.A. 337	67.4
19	L.I.A. 306	PM-1-8	"	58.5
17	L.I.A. 306	M-6200	Navy 105	58
33	NP	Navy 89A	"	56
27	L.I.A. 306	PM-1-30	L.I.A. 337	50
16	NP	M-6200	Navy 105	48.5
34	NP	Mfr. 55-54A	"	46.5
25	NP	PM-1-20	L.I.A. 337	43.7
36	NP	Navy 14	Navy 105	42.2
9	L.I.A. 339	L.I.A. 328	"	34.7
29	NP	PM-1-30	L.I.A. 337	25.5
2	L.I.A. 306	L.I.A. 33	Navy 105	23
11	L.I.A. 306	L.I.A. 338	"	22.7
22	L.I.A. 306	PM-1-20	"	22.7
4	L.I.A. 306	L.I.A. 35	"	21.7
21	NP	PM-1-8	L.I.A. 337	20.5
6	L.I.A. 306	L.I.A. 327	Navy 105	17.7
5	NP	L.I.A. 327	"	6.7
18	L.I.A. 306	PM-1-8	"	6
1	NP	L.I.A. 33	Navy 105	0
3	NP	L.I.A. 35	"	0
10	NP	L.I.A. 338	"	0
20	NP	PM-1-8	"	0
24	NP	PM-1-20	"	0
26	L.I.A. 306	PM-1-30	"	0
28	NP	PM-1-30	"	0
30	None	TS-20	"	0
31	None	20L15-1	"	0
32	None	20L15-2	"	0

Note: eNP: Navy phosphoric acid pretreatment