

LEAD INDUSTRIES ASSOCIATION

480 LEXINGTON AVENUE

NEW YORK 17, N. Y.

RED LEAD DIVISION

CONFIDENTIAL - FOR COMMITTEE USE ONLY

SUBJECT TO REVISION

RED LEAD TECHNICAL COMMITTEE

New York, N. Y.

July 30, 1946

A meeting of the members of the Red Lead Technical Committee of the Lead Industries Association was held in the Association's office on Friday, July 30, 1946. The following were present:

Committee

A.C. Goets
O.F. Shobe
J.O. Johnstone
A.J. Rickhoff

Representing

Eagle-Picher Lead Co.
Glidden Co.
Hammond Lead Products, Inc.
National Lead Co.

F.E. Normeer, Secretary-Treasurer of the Lead Industries Association
L.L. Carrick, Director of Red Lead Research

The meeting was called to order at 10:00 A.M. with Dr. L.L. Carrick presiding.

Mr. Normeer stated that Dr. Carrick had been considering an offer from the University of Michigan to join their faculty, with the prospect that he could serve outside commercial interests during his tenure of office. However, Dr. Carrick indicated that he was inclined to prefer to return to his former position as Dean of the School of Chemical Technology, North Dakota Agricultural College, Fargo, N.D. The Committee took the stand that it did not wish to influence Dr. Carrick in his decision and that it hoped that some means could be developed whereby the continuity of the work would not be seriously disturbed by Dr. Carrick's resignation.

The Committee made several suggestions of prospective successors to Dr. Carrick but a decision was deferred to a later meeting of the Committee.

BOX CAR PAINTS

In view of the Red Lead Technical Committee's directive to the Director of Red Lead Research of the L.I.A., the car shops of the Pennsylvania Railroad and the manufacturer of a large portion of paint for the C.B. & Q. Railroad were contacted with the following results:

1. The price of box car paints range from 85¢ to \$1.06 per gallon. A difference of 5¢ per gallon often is sufficient to waive other considerations.

2. While they have no standard temperature test, the paint must have sufficient flexibility to withstand sudden changes in temperature from 30° F. below to 100° F. above zero within a few minutes time.



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3. Application is usually by some type of spray equipment.

4. A drying time such that two coats may be applied in an 8 hour day is desirable. The general practice now is one coat every 24 hours.

5. New box cars receive two coats of box car paint, either in one day or 48 hours, as the painting schedule may be, followed by lettering (the second or third day).

6. The surface of new or old cars, that need an entire repaint job, are sand-blasted. Touch-up work is usually preceded by hand wire brushing. This topic is being given further study.

BRIEF STUDY OF THE PRESENT STATUS OF RED LEAD COOPERATIVE RESEARCH PROGRAM

The data submitted to the committee is summarized in Exhibit A, attached.

BATTELLE MEMORIAL INSTITUTE RESEARCH PROGRAM

The toxicity study of arc welding and flame cutting of painted steel surfaces has been delayed. It was to have started July 23. It is now scheduled for August 15. (See Exhibit B for additional details, attached).

The committee was unanimous in thinking it would be advisable to request the Bureau of Ships to send a representative to watch the collection of the fume gases at Columbus, Ohio.

The welding studies will start soon.

(See Exhibit C for a copy of letter of approval by O.R. Sutherland, Commander, U.S.N. Lab. Supt., to the welding program.)

ADDITIONAL FLORIDA EXPOSURE TEST

(Reported May 6, 1945 Minutes)

These panels for test are being prepared by the National Lead Co. at Sayville.

RESEARCH PROJECT NO. 7(c)

The purpose of this project is to check the advisability of employing a low or high polymerized phenolic vehicle with red lead-sine chromate-multiple pigmentations.

The general resume of this project and the records of the first three months of exposure are given in Red Lead Technical Bulletin No. 8, July 25, 1948.

The continuance of the exposure beyond the 4th month will be decided at the August 23-24 meeting of the Red Lead Technical Committee.

ATMOSPHERIC EXPOSURES

The committee feels these should be started at once and the program should be systematic.

The formulations for such a program should be perfected after the August 23-24 inspection of panels at the National Lead Co. Test Farm at Sayville, L.I.

NEXT MEETING

It was decided to hold the next meeting of the Committee at Sayville, L.I. on August 23-24, 1948.

It is desirable to spend two full days on this inspection trip.

Details of the arrangements will be worked out early in August.

The meeting adjourned at 8:30 P.M.

X. L. Carrick
L. L. Carrick

EXHIBIT A

BRIEF SUMMARY OF THE PRESENT STATUS
RED LEAD COOPERATIVE RESEARCH PROGRAM

INTRODUCTION

Twelve different projects have been outlined. Of these twelve projects eleven have been approved by the Red Lead Technical Committee.

Ninety-three different pigmentations have been approved for test and are being checked on exposure.

Eighty-eight different vehicles are employed with these 93 pigmentations.

One hundred and eighty-nine different paint formulations have been approved and are at various stages of evaluation. These are distributed between the eleven approved research projects. Standards exposed with each project are not included in these figures.

STATUS OF RESEARCH PROJECTS

RESEARCH PROJECT NO. 1

PURPOSE: To develop a red lead primer paint to meet the price range and the drying schedule of the existing zinc chromate primer paint used by the U.S. Navy.

GENERAL: Twenty-five paints were formulated at a meeting of the Red Lead Cooperative Committee, held at the Research Laboratories of the Eagle-Fischer Lead Co., Joplin, Mo., January 11-12, 1948.

RESULTS:

- A. The atmospheric exposures are not completed at this time.
- B. Tide-Range -- Only one paint stood the tide-range test for 7 months. Its final overall rating was 8, with 10 being perfect. This paint was rechecked in Research Project No. 2.
- C. The same formulation which was outstanding at tide-range was also the best for total submersions.

RESEARCH PROJECT NO. 2

PURPOSE: Formulations for submission to the U.S.N.C. for their test program.

GENERAL: Twelve primers were formulated at the Pittsburgh meeting of the Committee. These were sent to the U.S.N.C. August 9, 1948.

The above 12 primers were exposed by the Committee at:

1. National Lead Co. Test Fence Farm, Bayville, L.I.
2. San Francisco Bay, Calif.
3. Laboratory Accelerated Test by Eberlin-Williams Co. at Chicago.

RESULTS:

- A. The atmospheric exposure tests have not been completed.
- B. Tide-range and Total Submersion Exposures -- These have been completed. At the end of 7 months they indicate that a red lead-zinc chromate multiple pigmentation under the existing exposure conditions was better than either a 100% specification red lead or the specification zinc chromate

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standards or other combinations of pigment which did contain the red lead-sine chromate mixture.

The pigmentation is:

Red Lead (97% grade)	55%
Zinc Oxide	10%
Zinc Yellow	10%
Iron Oxide	7%
Magnesium Silicate	10%
Diatomaceous Silica	8%

A vehicle composed of 40% alkyd resin solution and 60% LV-257 Varnish (6 gallon length, 50% sumar V-2- $\frac{1}{2}$ and 50% K29432 resin) performed best with the above pigmentation.

This pigmentation and vehicle have since been used as a standard.

The paint which did so well in Research Project No. 1 was found to be inferior to the best formulation of Research Project No. 2 given above. This was mostly due to the short painting schedule required.

RESEARCH PROJECT NO. 3

PURPOSE: To determine the best PV to employ in the formulation of the best paints developed in Research Project No. 2.

GENERAL: Forty-three paints were exposed at the National Lead Co. Test Basin at Sayville, L.I.

Three different pigmentations and three different vehicles were involved.

The exposures are at tide-range, total submersion and in the atmosphere about two feet above high tide range.

RESULTS: The exposure is not sufficiently progressed to draw conclusions. Will require three months to complete total submersion, 6 months for the tide-range.

RESEARCH PROJECT NO. 4

PURPOSE: To determine the best red lead-mica-lith-C formulation for use in tide-range and total submersion anti-corrosive primer paints.

GENERAL: Twenty-nine different formulations and standards embracing water-ground mica and micronised mica are on exposure.

These are exposed as tide-range and total submersion tests at the National Lead Co. Marine Test Basin, Sayville, L.I.

RESULTS: It will be 3 to 6 months before definite conclusions may be drawn.

RESEARCH PROJECT NO. 5

This project was never approved.

RESEARCH PROJECT NO. 6

PURPOSE: The development of low-cost red lead-multiple pigmented primers to meet the cost of Maritime II-MC-19 and the Navy II-P-19 and at the same time have better protective value than the two above mentioned specifications.

GENERAL: Ten low-cost primers were checked against five different standards. The exposure was by the North Florida Test Service, Daytona Beach, Fla.

RESULTS: Two different primers were decidedly better than the standards. They are L.I.A. paints Nos. 111 and 108.

The red lead-sine chromate-multiple pigmentation of this project (similar to that of Research Project No. 2), combined with U.S.M.C. 82-MC-21 alkyl resin vehicle is being written into a specification by the U.S.M.C. It should be returned for our inspection during August, 1946.

RESEARCH PROJECT NO. 7 (This project is divided into four subprojects.)

Subproject (a)

PURPOSE: To check the effect of replacing BB432 in Vehicle 13 (V-13) with Dyphene 11080.

GENERAL: Six paints are involved in this subproject. The exposures are: tide-range and total submersion at the National Lead Co. Marine Test Basin, Sayville, L.I.

RESULTS: No definite conclusions may be drawn until the completion of the test about February, 1946.

Subproject (b)

PURPOSE: To check the ideas of the U.S.M.C. for modification of L.I.A. Vehicle 13 (V-13).

GENERAL: Six paints are involved in this subproject. These were prepared by the National Lead Co. and submitted to the U.S.M.C. Panels are also on exposure by the L.I.A. at the National Lead Co. Marine Test Basin at Sayville, L.I.

RESULTS: The exposures will not be completed until early in 1946.

Subproject (c)

PURPOSE: To check the advisability of employing a low or high polymerized phenolic vehicle with red lead-sine chromate multiple pigmentations.

GENERAL: Nineteen paints in addition to the standards were prepared. The panels are on exposure at the North Florida Test Service, Daytona Beach, Florida. Exposures are at tide-range and total submersion.

RESULTS: It will be September 1st before definite conclusions may be noted.

Subproject (d)

PURPOSE: To determine the proper oil modification of phthalic anhydride resin solution to use with red lead-sine chromate-multiple pigmentations.

GENERAL: Sixteen paints in addition to the standards have been delivered to the National Lead Co. Research Laboratory by the Glidden Co. and are in process of being applied to panels for exposure to the atmosphere, tide-range and total submersion conditions at Sayville, L.I.

RESULTS: No results can be expected for 8 to 10 months.

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RESEARCH PROJECT NO. 8

PURPOSE: To study red lead paints for gasholders and oil storage tank.

GENERAL: Fourteen paints have been approved. They have not been prepared to date.

RESEARCH PROJECT NO. 9

PURPOSE: To study the proper balance between alkyl resin solutions and LV-257 varnish of various oil lengths.

GENERAL: Nine paints were prepared by the Glidden Co. and delivered to the National Lead Co. in readiness for the application to exposure panels. These paints are in process of being exposed at Sayville, L.I. to atmospheric, tide-range and total submersion.

RESULTS: No results to date.

RESEARCH PROJECT NO. 10

PURPOSE: To study the proper method of application and to try and improve red lead primer paints for galvanized iron.

GENERAL: Seven formulations have been approved by the Red Lead Technical Committee. The paints are being prepared and will be applied September 1. The exposure is to the atmosphere in the Cleveland area, Joplin area and the New York area.

RESULTS: Must await completion of exposures.

RESEARCH PROJECT NO. 11

PURPOSE: To develop a red lead primer paint for the lock gates of the Upper Mississippi River Dams.

GENERAL: Six primer paints are being prepared and should be delivered July 1 to the Upper Mississippi River Engineer in charge of the locks.

RESULTS: Must await reports of Upper Mississippi River Authority Engineer's inspection.

RESEARCH PROJECT NO. 12

PURPOSE: To further interest the U.S. Navy in red lead-multiple pigmentations of better quality and equal cost to the present used S2-P-18, zinc chromate primer.

GENERAL: Five definite recommendations based on the research completed to date by the L.I.A. Red Lead Technical Committee have been forwarded to the Philadelphia Navy Yard. These are to be checked by L.I.A. as part of a Florida exposure.

RESULTS: Reports must await exposure by the Philadelphia Navy Yard personnel.

EXHIBIT B

THE FUME TEST TOXICITY STUDY SCHEDULE

<u>COATING</u>	<u>WELDING</u> <u>Thickness of Paint Film</u>			<u>OXY-ACETYLENE CUTTING</u> <u>10-min thick paint film</u>
	<u>10 mil</u>	<u>5 mil</u>	<u>1 mil</u>	
TT-P-88	3 x 10 min.	3 x 10 min.	3 x 10 min.	3 x 10 min.
52-MC-23	3 x 10 min.	3 x 10 min.	3 x 10 min.	3 x 10 min.
52-P-18	3 x 10 min.	3 x 10 min.		3 x 10 min.
144C	3 x 10 min.	None		3 x 10 min.
52-P-26	3 x 10 min.	None		3 x 10 min.
2 mil 52-P-18)				
8 mil 52-P-45)	3 x 10 min.	None		3 x 10 min.
2 mil 52-MC-23)				
8 mil 52-P-45)	3 x 10 min.	None		3 x 10 min.
2 mil 52-MC-23)				
8 mil 52-MC-6)	3 x 10 min.	None		3 x 10 min.
2 mil 52-MC-23)				
8 mil 52-MC-6)	3 x 10 min.	None		3 x 10 min.
52-P-22	3 x 10 min.	None		3 x 10 min.
Linseed Oil Vehicle of TT-P-88	3 x 10 min.	None		3 x 10 min.
Alkyd of 52-MC-23	3 x 10 min.	None		3 x 10 min.
Vehicle of 52-P-18	3 x 10 min.	None		3 x 10 min.

The toxicity study is based upon a plan to make triple test for each condition, each test requiring 10 minutes or a little less. Eighty-seven separate welding or oxy-acetylene cutting periods arranged by coating and coating thickness as indicated in the above table.

Unless changes are made subsequently, the concentration study will include the following items where they are specific for the sample tested.

- a. Iron
- b. Chromic acid
- c. Lead
- d. Antimony
- e. Zinc
- f. Carbon monoxide
- g. Acrolein
- h. Nitrogen oxides

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EXHIBIT C

UNITED STATES NAVY YARD
Philadelphia 12, Pa.

June 12, 1945

Lead Industries Association
420 Lexington Ave.
New York, N.Y.

Attn: Dr. L. L. Carriek

Gentlemen:

In reply to your letter of 31 May 1945, enclosing the tentative outline of the research project which the Lead Industries proposes to conduct at the Battelle Memorial Institute, it is advised that the outline has been studied with interest.

It is noted that the program quite closely parallels the one conducted by the Navy Department in 1941 to determine the effect of zinc chromate primers on welding. In addition, you have included a weld-bead test and the 1200 impact specimens. These are considered desirable additions to the program.

In general, it would seem that the program is amply comprehensive and complete for the purpose intended. It is especially noted that your program seems sufficiently extensive to distinguish between the effects of such materials as zinc chromate and lead oxide on the physical properties of the weld metal, and the trouble to the welding operator from the standpoint of manipulating the arc in a manner to obtain proper deposition of the weld metal, due to the presence of the paint. However, it would seem that by adding an additional specimen of each type and for each paint formula coated with the vehicle of the formula and free of pigment, a better estimate of the effect of the presence of the vehicle itself on welding difficulties would be obtained. You would then have information concerning the effect of the vehicle on "weldability" as distinguished from the added effect of the various pigments.

Some of the work done at this Yard in 1941 on the effect of zinc chromate primers on welding was published in the Welding Journal, Vol. VII, No. 9, September 1942, supplement pages 434s to 439s. This article may be of some interest to you.

Very truly yours,

(Signed) O. R. SUTHERLAND

Commander, U.S.N.
Lab. Supt.