

LEAD INDUSTRIES ASSOCIATION

888 MADISON AVENUE

NEW YORK 17, N. Y.

March 14, 1961

SUBJECT: FIRST DRAFT OF
LEAD PIGMENTS TECHNICAL
LETTER NO. 15

To Members of the Lead Pigments Technical Committee:

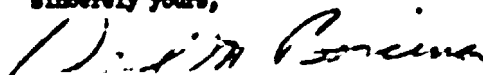
Attached please find the first draft of the proposed Lead Pigments Technical Letter No. 15 which in effect will replace all previous Technical Letters in this series.

You will note that the formulation numbers have been changed to conform to the numbering system decided upon at the last Committee meeting. A list of the old formula numbers and their proposed new numbers is also attached.

Technical Letter No. 15 will of course include in a separate section the complete formulations of all paints mentioned. These formulations have not been included with this first draft inasmuch as they will appear in the final draft exactly as they have appeared in previous Technical Letters.

This first draft will be reviewed at the meeting of the Committee on March 30, 1961 and I sincerely hope you will come prepared to offer your suggestions and criticisms.

Sincerely yours,



David M. Borcine,
Secretary, Lead Pigments Technical Committee

NEW FORMULATION NUMBERS FOR LEAD PIGMENTS TECHNICAL LETTER NO. 15

The Lead Pigments Technical Committee at its meeting on October 5, 1960 recommended that permanent numbers be assigned to the formulations to be included in Lead Pigments Technical Letter No. 15. Further, the Committee recommended the following numbering system:

TYPE OF VEHICLE

Oil
Oil-resin fortified
Alkyd
Epoxy
Vinyl
Miscellaneous

FORMULATION NUMBERS

L.I.A. Nos. 100 to 199
L.I.A. Nos. 200 to 299
L.I.A. Nos. 300 to 399
L.I.A. Nos. 400 to 499
L.I.A. Nos. 500 to 599
L.I.A. Nos. 600 to 699

With this in mind, I have prepared a list of the formulations that are to be included, giving their old numbers and the new numbers tentatively assigned to them, as follows:

L.I.A. FORMULATIONS

<u>Old Number</u>	<u>New Number</u>	<u>Old Number</u>	<u>New Number</u>
6 - 1	100	7 - 7	901
6 - 2	101	8 - 1	100
6 - 3	102	8 - 2	102
6 - 4	200	8 - 4	201
6 - 5	201	8 - 5	200
6 - 12	300	8 - 6	300
6 - 13	301	8 - 7	401
6 - 14	401	8 - 8	902
6 - 15	302	8 - 9	903
6 - 16	303	9 - 2	303
6 - 17	400	3 - 7	307
6 - 18	400	12 - 1	103
6 - 19	400	12 - 2	100
7 - 1	400	12 - 3	200
7 - 2	402	12 - 4	202
7 - 3	400	12 - 5	140
7 - 4	300	12 - 6	141
7 - 5	301	12 - 7	142
		L.I.A. 328	900

NOTE: Formula L.I.A. 201 to be changed to conform to BEPC-PS-53T.

First Draft

PROPOSED TEXT FOR LEAD PIGMENTS TECHNICAL LETTER NO. 15FOREWORD

(COPY NOT YET PREPARED. WILL BE WRITTEN AFTER
THE COMPLETE TEXT IS COMPLETED AND APPROVED.)

RECOMMENDED SURFACE PREPARATION OF STEEL

Proper surface preparation can not be stressed too strongly. The success or failure of a paint system very often depends upon the adequacy of such preparation. It is hoped therefore that these recommendations will aid the industrial user in getting the longest possible service life out of his paint.

Why Surface Preparation

(THE TEXT TO FOLLOW FROM PAGE 3 OF RED LEAD TECHNICAL LETTER NO. 11, INCLUDING TABLES ON PAGES 8 and 9. THE PAINT NUMBERS IN THESE CHARTS ARE TO BE CHANGED TO THE NEW NUMBERING SYSTEM.)

PAINTING HIGHWAY STRUCTURAL STEEL

This section offers highway engineers and others specifications for complete systems to be used in painting highway structural steel. The material contained herein is based on our own field test programs and on an extensive study of current practice of state highway departments and such authoritative sources as the American Association of State Highway Officials. Experience has shown that the practices and paints recommended will produce highly satisfactory results.

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PROPOSED TEXT FOR LEAD PIPEWORKS TECHNICAL LETTER NO. 15
(Continued)

Surface Preparation

(TEXT SAME AS PAGE 3, RED LEAD TECHNICAL LETTER NO. 12, REPLACING LAST PARAGRAPH AS FOLLOWS:)

A discussion of the recommended surface preparation will be found on Page ____.

Shop Coat or Primer

Formula L.I.A. No. 103

(See Page ____)

This paint has excellent wetting and performance characteristics. It is particularly suitable for use where surface preparation is restricted to power tool or hand wire brushing.

Formula L.I.A. No. 100

(See Page ____)

This paint is similar to Formula 103 with replacement of some of the raw linseed oil by bodied oil and additional thinner to provide similar viscosity. This formulation offers wetting characteristics almost as good as Formula 103, provides better leveling and develops lower gloss, thus offering an improved surface for recoating.

Formula L.I.A. No. 200

(See Page ____)

Where painting schedules require faster drying than are afforded by the foregoing formulations, paints formulated with alkyl resins are generally used. Formula 200 is a paint of this type and will not wet the surface as well as Formula 103 or 100. Greater care must be employed in the preparation of the surface and sandblasting is desirable.

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PROPOSED TEST FOR LEAD PIGMENTS TECHNICAL LETTER NO. 15

(Continued)

Formula L.I.A. No. 202

(See Page _____)

A pure red lead paint which offers fast drying characteristics and outstanding performance, and, like Formula 200, requires careful surface preparation and sandblasting is desirable.

Touch-Up

A shop coat may become damaged during transit or erection of structural steel. The damaged areas as well as field rivets, bolts, welds, etc. should be thoroughly cleaned and touched up to provide a continuous primer coat. For touch up purposes, the same paint that was used for the shop coat should be applied.

First Field Coat

The formulations, L.I.A. 100, 103, 200 and 202 are intended generally for shop coat application or for use in priming structures in the field that were erected with unpainted steel.

These same primers, tinted with lamp black in oil for contrast, are generally used for the first field coat when multiple coat systems are specified.

It is often found desirable to use Formula L.I.A. No. 200 as a field coat over primers L.I.A. 100, 103 and 202. There are three reasons for this:

1. It has a contrasting color,
2. It is a fast-drying paint permitting earlier finishing, and
3. It is more economical.

If in a multiple coat system, a light finish coat is specified, a white lead base paint is generally used for the first and/or second field coat. Formulas 140 and 141 are typical for this application.

The following paints are intended for use as first field coats over primer Formulas L.I.A. 100, 103, 200 and 202 in three coat systems and for the third coat in four coat systems where a light color is desired. They may be used tinted.

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PLANT DATA

PROPOSED TEST FOR LEAD PIGMENTS TECHNICAL LETTER NO. 15
(Continued)

Formula L-I.A. No. 140

(See Page _____)

Formula L-I.A. No. 141

(See Page _____)

Top Coats

Any of the foregoing recommendations for primer or field coats provide excellent foundations for any good top or finish coat.

The following is a typical foliage green top or finish coat of pleasing color and good durability:

Formula L-I.A. No. 142

(See Page _____)

The following has a white base of good durability and can be tinted to the desired color.

Formula L-I.A. No. 140

(See Page _____)

Where color is not considered important, black (A.A.S.H.O. Designation M69-32) or aluminum (A.A.S.H.O. Designation M69-54) top coats may be substituted for the white or tinted paints.

(COPY TABLE ON PAGE 6 OF RED LEAD TECHNICAL
LETTER NO. 12 USING THE NEW NUMBERING SYSTEM
FOR FORMULATIONS.)

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First Draft

PROPOSED TEXT FOR LEAD PIGMENTS TECHNICAL LETTER NO. 13
(Continued)

PRIMERS FOR RAILROAD STRUCTURES AND ROLLING STOCK

This section includes primer paints formulated to meet all commonly encountered surface conditions and environments of the railroad industry. The recommended formulations include economical and high-quality primer paints for railroad bridges and other structures along the right-of-way and also, two low-cost formulations designed specifically to meet the need for an improved anticorrosive primer for steel rolling stock.

For Steel Containing Mill Scale
and Residual Rust (Slow Dry)

The following formulations are used successfully on ferrous surfaces containing tightly adherent mill scale and small amounts of rust. This type of surface is prevalent where preparation is limited to hand or power wire brushing, scraping, flame cleaning or combinations of these methods, see page _____. The free linseed oil content of these paint vehicles assures the degree of wetting ability needed for good anchorage to a heterogeneous surface.

Formula L.I.A. No. 100

(See Page _____)

This is the highest quality primer available for shop and field priming of steel where surface preparation is limited to the methods mentioned above.

Formula L.I.A. No. 101

(See Page _____)

This is a high quality reduced red lead content primer suitable for use on the surfaces prescribed.

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First Draft

PROPOSED TEXT FOR LEAD PIGMENTS TECHNICAL LETTER NO. 15
(Continued)

For Steel Containing Mill Scale and
Residual Rust (Accelerated Dry)

The following two high quality primer formulations are intended for priming, intermediate and maintenance coats on structural steel when work schedules demand accelerated drying. Although these vehicles contain enough free oil to attain reasonably good wetting of the metal surface, their wetting characteristics are limited by the presence of synthetic resins. For optimum performance they should be applied to surfaces freed of loose mill scale and corrosion products. The steel must be degreased and carefully cleaned, see page _____.

Formula L.I.A. No. 801

(See Page _____)

This is an excellent and widely used red lead-iron oxide paint with good hiding power and chalk resistance.

Formula L.I.A. No. 800

(See Page _____)

This is a high quality specification primer that has received wide acceptance for shop and field prime coats for structural steel.

For Steel Completely Free of Mill
Scale and Rust (Fast Dry)

The following two fast drying formulations are suggested for application over steel thoroughly freed from rust, mill scale and other foreign matter by pickling or sandblasting, see page _____. These synthetic vehicle primers offer outstanding protection in industrial environments where the atmosphere is contaminated with chemical fumes.

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PROPOSED TEST FOR LEAD PRIMER'S TECHNICAL LETTER NO. 15
(CONTINUED)

Formula L.I.A. No. 302

(See Page _____)

This is a heavy duty, full red lead primer intended for use on sand-blasted structures and factory fabricated equipment such as railroad cars, window sash, signal equipment, etc.

Formula L.I.A. No. 301

(See Page _____)

This is a medium weight red lead paint for use on surfaces which are exposed to rural, industrial and marine atmospheres of high humidity.

(HOW ABOUT SURFACE PREPARATION?)

PRIMER FORMULATIONS FOR ROLLING STOCK

The transition to steel cars has indicated a definite need for better low-cost primers having rust inhibitive properties to protect the equipment against corrosion. Considering the low cost of the following two formulations, these primers have an unusually high degree of desirable characteristics for the protection of steel rolling stock. Both these primers dry for handling in 4 to 6 hours and dry for recoating in about 18 hours.

Formula L.I.A. No. 902

(See Page _____)

Formula L.I.A. No. 901

(See Page _____)

PAINTED HYDRAULIC STRUCTURES

This section contains suggested corrosion inhibitive paint systems for steel surfaces exposed to moist and chemically contaminated atmospheres environments as well as surfaces immersed intermittently or continuously in fresh water. It describes systems specifically designed for application to dams and adjacent equipment, ships navigating in fresh waters, water

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PROPOSED TEST FOR LEAD PIGMENTS TECHNICAL LATTER NO. 11
 (Continued)

First Draft

storage tank interiors and heavy industrial equipment.

Several complete protective systems are described, including both anti-corrosive and finish coats. Proper surface preparation procedures for each type of system are also included.

Systems for Atmospheric Exposure

The following painting schedules are suggested for interior and exterior ferrous surfaces adjacent to the water but exposed to normal atmospheric exposure. Among structures classified in this category are bridges, light standards and railings.

The surface should be freed from loose mill scale and rust by sandblasting or wire brushing and scraping. Oil and grease should be removed by solvent cleaning. See section, Recommended Surface Preparation of Steel, page ____.

Paint Formulas* To Be Applied

1st Coat	2nd Coat	3rd Coat	4th Coat
L.I.A.100	L.I.A.100 (Tinted)	L.I.A.402 (Tinted)	L.I.A.402
1.5 mils dry film thickness		1.0 mils dry film thickness	
.....			
L.I.A.200	L.I.A.200 (Tinted)	L.I.A.402 (Tinted)	L.I.A.402
1.5 mils dry film thickness		1.0 mils dry film thickness	
.....			

* Complete formulas will be found as follows:

L.I.A. No. 100 - Page _____

L.I.A. No. 200 - Page _____

L.I.A. No. 402 - Page _____

PROPOSED TEST FOR LEAD PIGMENTS TECHNICAL LETTER NO. 15
(Continued)

Paint Data

**SYSTEMS FOR PARTIAL OR CONTINUOUS IMMERSION
IN FRESH WATER**

The following painting systems are especially suitable for ferrous surfaces which are in whole or in part subjected to moisture condensation or immersion in fresh water. Among the structures for which these systems are suggested are crest gates, sluice gates, tainter gates and exposed structural steel at pumping stations.

Before paint application, the surface should be blast cleaned, see page _____, and treated with a chemical metal conditioner such as Formula L.I.A. No. 901, see page _____, applied to a dry film thickness of 0.3 to 0.5 mils.

Paint Formulas* To Be Applied

<u>1st Coat</u>	<u>2nd Coat</u>	<u>3rd Coat</u>	<u>4th Coat</u>
L.I.A. 400	L.I.A. 400 (Tinted)	L.I.A. 400	L.I.A. 400 (Tinted) or L.I.A. 402

Dry film thickness, each coat, 1.5 mils???

.....
L.I.A. 900** L.I.A. 900 (Tinted) L.I.A. 901 (Tinted) L.I.A. 901

Dry film thickness, 1.5 mils

Dry film thickness, 1.0 mils

.....
* Complete formulas will be found as follows:

L.I.A. No. 400 - Page _____

L.I.A. No. 402 - Page _____

L.I.A. No. 900 - Page _____

L.I.A. No. 901 - Page _____

** This must be preceded by metal conditioning wash coat primer such as L.I.A. No. 901, see page _____.

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PROPOSED TEST FOR LEAD FILMENTS TECHNICAL LETTER NO. 13First Draft

(Continued)

GUIDE FOR SEAWATER PROTECTION

Fundamentally, 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. The Formula No. 117 pretreatment (Military Specification MIL-C-15328, available upon request to the Commanding Officer, Naval Aviation Supply Depot, 5801 Tabor Avenue, Philadelphia, Pa., attention Code CDS) 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, two or three coats of the primer should be applied to reach a minimum dry film thickness of 5 mils. Records in the Bureau indicate the primers were "applied in three coats." Normal application is by spray rather than brush. In applying the primer, a minimum drying period of six hours should be allowed between coats and six hours before the antifouling paint.

A variety of antifouling coatings are in current use for ship bottoms and similar service. Cold plastic coating No. 105 (MIL-P-19451) and Hot plastic No. 15 HPH (MIL-P-19452) were used in Navy tests. Others include Maritime Commission coal tar-resin antifouling coating 53-MC-403 and Bureau of Ships Formula No. 121, a vinyl antifouling coating (MIL-P-19931.) Less is known

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PROPOSED TEXT FOR LEAD PIGMENTS TECHNICAL LETTER NO. 35
 (Continued)

about the compatibility of the system, L.I.A. 900/De Ships 121, and the system should not be used without prior tests.

The anticorrosive primer recommended here, L.I.A. No. 900, was developed after a thorough screening by the Lead Pigments Technical Committee and full scale "service tests" conducted by the U.S. Navy. These tests, carried out on the hulls of three U.S. destroyers, were completed early in 1979. On the basis of these test results, red lead-sourmarone primer (L.I.A. No. 900) appears to have performed comparably to the more expensive ϕ W (MIL-P-19453) coating which is the Navy standard for ship bottom service for antifouling systems other than vinyl.

On one of the three ship bottoms, it was found that the red lead primer affords protection that is equal or very slightly better than Navy standard anticorrosive ϕ W. In a second case, the red lead primer was judged to be slightly inferior (average merit score of 98.3 vs. 99.5). In the third case there was no significant difference in performance between red lead primers and ϕ W discernible.

PRIMERS FOR INDUSTRIAL AND MARINE ENVIRONMENTS

The following fast-drying formulation is recommended to industrial users as a primer for paint systems to protect steel surfaces exposed in chemically contaminated atmospheres and marine environments such as storage tanks, ship superstructures, bridges and dock installations.

Surface Preparation

As with other fast drying primers, application on steel free of rust, grease and other foreign matter is essential for best performance, see page _____.

Formula L.I.A. No. 357

(See Page _____)

This primer has been thoroughly test evaluated with excellent results and has been adopted as a standard primer by major industrial companies.

PROPOSED TEST FOR LEAD PIGMENTS TECHNICAL LETTER NO. 303
(Continued)

PRIMER FOR RUSTED, WEATHERED OR NEW GALVANIZED STEEL

After a full six years of extensive field investigations, the performance of the following red lead-sine dust-iron oxide primer for galvanized steel proved outstanding. No matter what the surface, rusted, weathered or treated new, this primer outperformed lead-free primers generally recommended for galvanized surfaces.

Surface Preparation

To insure good adhesion and to obtain the most satisfactory protection with primer L.I.A. No. 303 on rusted galvanized surfaces, the corroded areas should be wire brushed to remove rust scale followed by washing with clean mineral spirits. On new galvanized steel, the surface should be allowed to weather for 3 to 6 months or if time does not permit, the surface should be chemically pretreated.

The Lead Pigments Technical Committee has examined a number of commonly used pretreatment procedures and found, for example, that treatments with copper sulphate, acetic acid, or hydrochloric acid are ineffective. However, phosphate type treatments effectively etch the zinc surface and greatly improve the adhesion of the paint film. Proprietary products of this type are generally available.

Formula L.I.A. No. 303

(See Page _____)

This primer is ideally suited for maintenance painting of galvanized surfaces particularly where the condition of the surface area to be painted may vary from rusty to weathered to new. It now makes possible the use of a single primer that will effectively protect galvanized surfaces against further deterioration regardless of their condition. Formula L.I.A. No. 303 is effective as a primer in one or more coats either exposed to the weather or covered with a suitable finish coat.