

LEAD INDUSTRIES ASSOCIATION

430 LEXINGTON AVENUE

NEW YORK 17, N. Y.

October 19, 1948

To Members of the Lead Industries Associations

SUBJECT: RED LEAD TECHNICAL LETTER NO. 3

We are enclosing a copy of Red Lead Technical Letter No. 3, "Red Lead Primers for Atmospheric Exposure" which has just been issued by the Red Lead Technical Committee of the Lead Industries Association. It is based on the research programs which have been conducted by the Committee during the past few years and on actual performance experience.

The Letter will be circulated, within the next week, to between 6,000 and 7,000 paint manufacturers and specifiers and buyers of paints for the protection of structural steel.

We are sending you a copy merely to keep you informed of the activities of the Association in all fields.

Very truly yours,

Robert L. Frazier
Secretary



RED LEAD PRIMERS

for

ATMOSPHERIC EXPOSURE

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Red Lead Technical Committee
LEAD INDUSTRIES ASSOCIATION
 420 LEXINGTON AVENUE
 NEW YORK 17, N. Y.

Foreword

THE policy of the Lead Industries Association is to encourage the proper and economical use of lead products of all types. Through its Red Lead Technical Committee, comprised of representatives of the red lead and paint industries, it endeavors to furnish suggested formulations for high performance red lead base primers for the protection of iron and steel. The Committee also conducts extensive research programs through member companies and enters into cooperative investigations with many government agencies and industry. In planning these cooperative projects, the Red Lead Technical Committee takes into consideration the latest pertinent developments in pigments, vehicles and techniques of application.

Red Lead Technical Letters are issued from time to time by the Lead Industries Association to acquaint manufacturers, specifiers and users of paints with the latest developments in metal protective paint primers.

The red lead base formulations that follow have been selected on the basis of outstanding performance under actual field conditions. These are suited for use under a wide variety of good quality topcoat paints based on oil or synthetic type vehicles. They are presented here as typical of some of the possibilities of red lead primers. Information on specific paint problems can be obtained from the Lead Industries Association or from the member companies listed below.

Manufacturers of Red Lead

THE EAGLE-PICHER COMPANY American Building, Cincinnati 1, Ohio

W. P. FULLER & COMPANY 301 Mission Street, San Francisco 1, California

Baton, Baton Rouge, Fresno, Los Angeles, Oakland, Phoenix, Portland (Or.), Sacramento, Salt Lake City, San Diego, Seattle, Spokane, Tacoma, Yakima (Wash.)

THE GLENN COMPANY 1396 Union Commerce Building, Cleveland 14, Ohio

Albany, Boston, Minneapolis, New York, North Bergen (N. J.), San Francisco, Adams & Elting Division, Chicago, American Paint Works Division, New Orleans, Campbell Paint & Varnish Division, St. Louis, Hubbs Paint & Varnish Division, Chicago, A. Williams Company Division, Reading, Canadian Division, Toronto, The Chemical & Pigment Company, Baltimore, Coltonville (Ill.), Oakland, Eastern Lead Company, Scranton, Metals Refining Company (representative), Detroit, Hammond (Ind.), Kansas City (Mo.), New Orleans, New York, Philadelphia, Pittsburgh, St. Louis, Ft. Thomas (Ky.)

HAMMOND LEAD PRODUCTS, INC. First Trust Building, Hammond, Indiana
430 Lexington Avenue, New York 17, N. Y.

NATIONAL LEAD COMPANY 111 Broadway, New York 6, N. Y.

Buffalo, Chicago, Cincinnati, Cleveland, Pittsburgh, St. Louis, San Francisco, National Lead Company of Mass., Boston, John T. Lewis & Son Company, Philadelphia

RED LEAD PRIMERS for ATMOSPHERIC EXPOSURE

Red Lead Oil Vehicle Primers

PRIMERS based on these formulas are indicated for use on bridges, similar structural steel and other ferrous metal surfaces. They are suitable for priming and body coats, either in the shop or field, where good resistance to the corrosive effects of usual atmospheric environment is required. The vehicle solids, consisting entirely of linseed oil offer the best means of wetting the metal and obtaining an intimate bond of the paint with the surface, despite the presence of limited amounts of corrosion products found impractical to remove.

FORMULA 3-1

A red lead - iron oxide multiple pigment linseed oil paint.

Composition	Pounds	Pounds	Ounces
PIGMENT: Red Lead	80.0	608	9.42
Siliceous Iron Oxide (75-85% Fe ₂ O ₃)	20.0	232	6.98
Magnesium Silicate	20.0	232	6.75
	100.0		
VEHICLE: Raw Linseed Oil	64.0	240	44.85
Linseed Oil (Z-8 Body)	8.0	36	8.90
Thinner and Drier**	28.0	108	25.78
	100.0	1784	100.00

Pigment = 985
Vehicle = 308
Wt./Gal. = 17 lbs.
PV = 336

* The addition of aluminum amounts up to 0.5% by weight of pigment is suggested to moderate expansion of the pigment in the vehicle.
** Drier: 0.5% lead, 0.25% manganese, 0.25% cobalt based on oil content.

FORMULA 3-2

(This is Type I of the Pending Revision of Federal Specification TT-P-36)

Composition	Pounds	Pounds	Ounces
PIGMENT: Red Lead (97% Grade)	99.7	1800	25.06
Aluminum Silicate	0.3	5.5	0.86
	100.0		
VEHICLE: Raw Linseed Oil	48.0	208	34.80
Pale Heat Treated Linseed Oil (Z-8 Viscosity)	17.0	90.8	11.60
Mineral Spirits	20.0	154.5	20.80
Drier*	5.0	36.4	9.18
	100.0	2309.5	100.00

Pigment = 77.88
Vehicle = 22.25
Wt./Gal. = 34 lbs.
PV = 306

* Federal Specification TT-P-361a, Type I

Red Lead Oil-Varnish Vehicle Primers

FORMULA S-3

A red lead multiple pigment paint from which good service has been obtained on structural steel.

Component	Pounds	Pounds	Gallons
PIGMENT: Red Lead (97% Crude)	71.0	1001	11.20
Silicous Iron Oxide (75-85% FeO ₂)	54.0	861	9.10
Aluminum Silicate	0.5	8.0	0.09
	125.5		
VEHICLE: Raw Linseed Oil	57.0	888	48.10
Spr Varnish (F.S. TT-V-12 Bn.) ^a	25.0	100	19.10
Thinner and Deter ^b	12.0	100	15.00
	100.0	1000.0	100.00

Pigment = 70%
 Vehicle = 30%
 Wt./Gal. = 10 Bn.
 TV = 525

^a 1.00 gallon, 100% pure, 100% of weight.
^b Deter: 0.5% lead, 0.5% manganese, 0.5% zinc, which based on oil content.

FORMULA S-4

A red lead - iron oxide multiple pigment paint which will dry much faster than Formula S-1, page 6.

Component	Pounds	Pounds	Gallons
PIGMENT: Red Lead (97% Crude)	80.0	800	8.44
Silicous Iron Oxide (75-85% FeO ₂)	20.0	200	2.08
Magnesium Silicate	20.0	200	2.70
	100.0		
VEHICLE: Linseed Oil	20.0	274	26.21
Varnish (F.S. TT-V-12 Bn.)	20.0	100	14.41
Thinner and Deter ^a	20.0	100	14.71
	100.0	1711	100.00

Pigment = 60%
 Vehicle = 40%
 Wt./Gal. = 17 Bn.
 TV = 500

^a Deter: 0.5% lead, 0.5% manganese, 0.5% zinc, which based on oil content.

FORMULA S-5

(This is Type II of the Painting Division of Federal Specification TT-P-561)

Formula S-5 is designed for use where painting schedules require handling and covering in 10 hours. Free bonded oil is present in this paint for better workability to obtain more intimate bonding with the surface.

Component	Pounds	Pounds	Gallons
PIGMENT: Red Lead (97% Crude)	80.0	740	10.10
Iron Oxide (85% FeO ₂)	12.0	104	4.30
Magnesium Silicate	14.0	100	7.10
Mica	4.0	40	1.20
Aluminum Silicate	0.5	8.0	0.09
	100.0		
VEHICLE: Alkyd Resin ^a	57.0	887	10.00
Raw Linseed Oil	25.0	100	20.00
Mineral Spirits	14.1	88.0	12.00
Lead Naphthenate Deter (50% Pb)	0.5	4.0	0.44
Cobalt Naphthenate Deter (50% Co)	0.5	4.0	0.44
	100.0	1738.0	100.00

Pigment = 60%
 Vehicle = 40%
 Wt./Gal. = 17 Bn.
 TV = 500

^a Mixture of high bond modified phenyl plasticizer alkyd (50% plasticizer), 50% alkyd in mineral spirits.

FORMULA 3-6

This red lead-iron oxide paint is designed for use as a shop or field coat on new work as well as in general maintenance.

	Composition	Pounds	Pounds	Gallons
PIGMENT:	Red Lead (F. S. TT-8-191a, Type I, Grade C).....	75.0	1340	18.80
	Iron Oxide (F. S. TT-M-581)	84.7	407	11.70
	Aluminum Stearate (M. S. SS-A-12a)	0.3	5	0.70
		100.0		
VEHICLE:	Raw Linseed Oil	65.3	335	44.30
	Alkyd Resin (U. S. Maritime Commission Specification 51-MC-501, Type II)	83.6	184	28.80
	Lead Naphthenate Drier (343 Pb)	0.3	4.8	0.80
	Cobalt Naphthenate Drier (66 Co)	0.3	1.8	0.30
		100.0	2300.4	100.00

Pigment = 75%
Vehicle = 33%
Wt./Gal. = 22 lbs.
PV = 33%

Red Lead Synthetic Vehicle Primers

FORMULA 3-7

This red lead multiple pigment paint is designed as a primer for paint systems on surfaces exposed to marine atmospheres such as ship superstructures, bridges and dock installations. As with other synthetic vehicle primers, application on steel free from corrosion products and other foreign matter is essential for the best performance.

	Composition	Pounds	Pounds	Gallons
PIGMENT:	Red Lead (97% Grade)	55.0	518	7.00
	Zinc Oxide	10.0	94	2.08
	Zinc Yellow (Zinc Chromate)	10.0	94	2.37
	Iron Oxide (83% Fe ₂ O ₃)	7.0	65.8	1.80
	Magnesium Silicate	10.0	94	2.90
	Diatomaceous Silica	8.0	71.8	2.30
		100.0		
VEHICLE: (L.I.A. No. 27)*	Dehydrated Castor Oil Alkyd	100.0	302	77.80
		100.0	1532.1	100.00

Pigment = 61.5%
Vehicle = 38.5%
Wt./Gal. = 15 lbs.
PV = 40%

* L.I.A. Vehicle No. 27

Dehydrated Castor Oil Fatty Acids (Ludlow)	61.50
Chrysotol	12.0
Phthalic Anhydride	20.0
Mixed Epoxies	25.0
	100.00

Cooking Procedure: Heat first three items under cover and CO₂ gas to 250°F. in 40 minutes. Flurry increases to 475°F. and hold at temperature for approximately 100 minutes. Cool and reduce.

Non-Volatile = 86.5% by wt.
Viscosity = 2 Cusdine (77°F.)
Acid Number = 8-10 (as solids)
Phthalic Anhydride (Weight of Solids) = 50%

FORMULA 8-8

(This is Type III of the Pending Revision of Federal Specification TT-P-84)

This synthetic vehicle paint was formulated for thoroughly cleaned iron and steel surfaces and for touch-up work where drying within a six-hour period is desired. It is recommended for use on smooth steel, particularly as an industrial primer for priming articles fabricated at the factory, such as railroad cars, window sash, air-conditioning condenser, etc. This paint is also well suited as a fast drying general maintenance primer for touch-up work on thoroughly cleaned steel.

Composition	Percent	Pounds	Ounces
PIGMENT: Red Lead (97% Grade)	88.7	127.9	17.99
Aluminum Silicate	0.3	0.5	0.48
	100.0		
VEHICLE: Alkyd Resin ^a	84.0	322.5	67.39
Aromatic Petroleum Spirits	14.5	55	12.79
Cobalt Naphthenate (85 Co)	0.5	1.9	0.39
Antioxidants and Wetting Agents	1.0	7.5	0.94
	100.0	1000.5	100.00

Pigment = 67.39
 Vehicle = 55.79
 Wt./Gal. = 10 lbs.
 PV = 385

^a This alkyd is identical to that specified in the vehicle of Formula 8-9, on page 6.

FORMULA 8-9

(This is Type IV of the Pending Revision of Federal Specification TT-P-84)

This formulation was designed primarily as an anticorrosive paint for total immersion in fresh water. For this application a dry film thickness of approximately 5 mils (3-4 coats) is suggested.

This paint is also suitable as a primer on iron and steel surfaces exposed to the atmosphere, particularly under conditions of high humidity. In addition to its excellent water impermeability, this paint has good resistance to alkaline environments.

Water storage tanks, structural work on dams, equipment in heating plants, lumber and other are typical of steel surfaces on which this paint is effective as a protective coating. This paint dries to a tack free film in 4 hours.

Clean surfaces, free from rust and rust scale, are required to insure the best performance.

Composition	Percent	Pounds	Ounces
PIGMENT: Red Lead (97% Grade)	88.0	880	12.85
Diatomaceous Silica	0.0	0.0	0.00
Magnesium Silicate	0.0	74	2.10
Aluminum Silicate	0.00	4.4	0.55
	100.0		
VEHICLE: Phenolic Varnish ^a	74.0	438	67.79
Aromatic Petroleum Spirits	22.4	122.7	17.79
Dipentene	2.75	10	2.39
Antioxidants	0.5	0.5	0.37
Lead Naphthenate (84% Pb)	0.25	1.4	0.15
Cobalt Naphthenate (85 Co)	0.00	0.5	0.04
Manganese Naphthenate (85 Mn)	0.00	0.5	0.04
	100.00	1000.0	100.00

Pigment = 88.00
 Vehicle = 54.15
 Wt./Gal. = 17 lbs.
 PV = 415

^a Phenolic Varnish

Phenolic Varnish (100% pure, solvent and plasticizer-free)	10.00%
Lead Oxide (PbO) (Type 1)	1.00%
Lead Oxide (PbO) (Type 2)	1.00%
Lead Oxide (PbO) (Type 3)	1.00%
Lead Oxide (PbO) (Type 4)	1.00%
Lead Oxide (PbO) (Type 5)	1.00%
Lead Oxide (PbO) (Type 6)	1.00%
Lead Oxide (PbO) (Type 7)	1.00%
Lead Oxide (PbO) (Type 8)	1.00%
Lead Oxide (PbO) (Type 9)	1.00%
Lead Oxide (PbO) (Type 10)	1.00%
Lead Oxide (PbO) (Type 11)	1.00%
Lead Oxide (PbO) (Type 12)	1.00%
Lead Oxide (PbO) (Type 13)	1.00%
Lead Oxide (PbO) (Type 14)	1.00%
Lead Oxide (PbO) (Type 15)	1.00%
Lead Oxide (PbO) (Type 16)	1.00%
Lead Oxide (PbO) (Type 17)	1.00%
Lead Oxide (PbO) (Type 18)	1.00%
Lead Oxide (PbO) (Type 19)	1.00%
Lead Oxide (PbO) (Type 20)	1.00%
Lead Oxide (PbO) (Type 21)	1.00%
Lead Oxide (PbO) (Type 22)	1.00%
Lead Oxide (PbO) (Type 23)	1.00%
Lead Oxide (PbO) (Type 24)	1.00%
Lead Oxide (PbO) (Type 25)	1.00%
Lead Oxide (PbO) (Type 26)	1.00%
Lead Oxide (PbO) (Type 27)	1.00%
Lead Oxide (PbO) (Type 28)	1.00%
Lead Oxide (PbO) (Type 29)	1.00%
Lead Oxide (PbO) (Type 30)	1.00%
Lead Oxide (PbO) (Type 31)	1.00%
Lead Oxide (PbO) (Type 32)	1.00%
Lead Oxide (PbO) (Type 33)	1.00%
Lead Oxide (PbO) (Type 34)	1.00%
Lead Oxide (PbO) (Type 35)	1.00%
Lead Oxide (PbO) (Type 36)	1.00%
Lead Oxide (PbO) (Type 37)	1.00%
Lead Oxide (PbO) (Type 38)	1.00%
Lead Oxide (PbO) (Type 39)	1.00%
Lead Oxide (PbO) (Type 40)	1.00%
Lead Oxide (PbO) (Type 41)	1.00%
Lead Oxide (PbO) (Type 42)	1.00%
Lead Oxide (PbO) (Type 43)	1.00%
Lead Oxide (PbO) (Type 44)	1.00%
Lead Oxide (PbO) (Type 45)	1.00%
Lead Oxide (PbO) (Type 46)	1.00%
Lead Oxide (PbO) (Type 47)	1.00%
Lead Oxide (PbO) (Type 48)	1.00%
Lead Oxide (PbO) (Type 49)	1.00%
Lead Oxide (PbO) (Type 50)	1.00%
Lead Oxide (PbO) (Type 51)	1.00%
Lead Oxide (PbO) (Type 52)	1.00%
Lead Oxide (PbO) (Type 53)	1.00%
Lead Oxide (PbO) (Type 54)	1.00%
Lead Oxide (PbO) (Type 55)	1.00%
Lead Oxide (PbO) (Type 56)	1.00%
Lead Oxide (PbO) (Type 57)	1.00%
Lead Oxide (PbO) (Type 58)	1.00%
Lead Oxide (PbO) (Type 59)	1.00%
Lead Oxide (PbO) (Type 60)	1.00%
Lead Oxide (PbO) (Type 61)	1.00%
Lead Oxide (PbO) (Type 62)	1.00%
Lead Oxide (PbO) (Type 63)	1.00%
Lead Oxide (PbO) (Type 64)	1.00%
Lead Oxide (PbO) (Type 65)	1.00%
Lead Oxide (PbO) (Type 66)	1.00%
Lead Oxide (PbO) (Type 67)	1.00%
Lead Oxide (PbO) (Type 68)	1.00%
Lead Oxide (PbO) (Type 69)	1.00%
Lead Oxide (PbO) (Type 70)	1.00%
Lead Oxide (PbO) (Type 71)	1.00%
Lead Oxide (PbO) (Type 72)	1.00%
Lead Oxide (PbO) (Type 73)	1.00%
Lead Oxide (PbO) (Type 74)	1.00%
Lead Oxide (PbO) (Type 75)	1.00%
Lead Oxide (PbO) (Type 76)	1.00%
Lead Oxide (PbO) (Type 77)	1.00%
Lead Oxide (PbO) (Type 78)	1.00%
Lead Oxide (PbO) (Type 79)	1.00%
Lead Oxide (PbO) (Type 80)	1.00%
Lead Oxide (PbO) (Type 81)	1.00%
Lead Oxide (PbO) (Type 82)	1.00%
Lead Oxide (PbO) (Type 83)	1.00%
Lead Oxide (PbO) (Type 84)	1.00%
Lead Oxide (PbO) (Type 85)	1.00%
Lead Oxide (PbO) (Type 86)	1.00%
Lead Oxide (PbO) (Type 87)	1.00%
Lead Oxide (PbO) (Type 88)	1.00%
Lead Oxide (PbO) (Type 89)	1.00%
Lead Oxide (PbO) (Type 90)	1.00%
Lead Oxide (PbO) (Type 91)	1.00%
Lead Oxide (PbO) (Type 92)	1.00%
Lead Oxide (PbO) (Type 93)	1.00%
Lead Oxide (PbO) (Type 94)	1.00%
Lead Oxide (PbO) (Type 95)	1.00%
Lead Oxide (PbO) (Type 96)	1.00%
Lead Oxide (PbO) (Type 97)	1.00%
Lead Oxide (PbO) (Type 98)	1.00%
Lead Oxide (PbO) (Type 99)	1.00%
Lead Oxide (PbO) (Type 100)	1.00%

Curing Procedure: Heat all the coats and all to 200°F. in 45 minutes. Hold for length of time necessary to dry through (15-20 minutes), or until the desired properties have been obtained in the specified water system. Water and the web material shall.

Oil Soluble	1.00%	Oil Soluble	1.00%
Lead Oxide (PbO) (Type 1)	1.00%	Lead Oxide (PbO) (Type 1)	1.00%
Lead Oxide (PbO) (Type 2)	1.00%	Lead Oxide (PbO) (Type 2)	1.00%
Lead Oxide (PbO) (Type 3)	1.00%	Lead Oxide (PbO) (Type 3)	1.00%
Lead Oxide (PbO) (Type 4)	1.00%	Lead Oxide (PbO) (Type 4)	1.00%
Lead Oxide (PbO) (Type 5)	1.00%	Lead Oxide (PbO) (Type 5)	1.00%
Lead Oxide (PbO) (Type 6)	1.00%	Lead Oxide (PbO) (Type 6)	1.00%
Lead Oxide (PbO) (Type 7)	1.00%	Lead Oxide (PbO) (Type 7)	1.00%
Lead Oxide (PbO) (Type 8)	1.00%	Lead Oxide (PbO) (Type 8)	1.00%
Lead Oxide (PbO) (Type 9)	1.00%	Lead Oxide (PbO) (Type 9)	1.00%
Lead Oxide (PbO) (Type 10)	1.00%	Lead Oxide (PbO) (Type 10)	1.00%
Lead Oxide (PbO) (Type 11)	1.00%	Lead Oxide (PbO) (Type 11)	1.00%
Lead Oxide (PbO) (Type 12)	1.00%	Lead Oxide (PbO) (Type 12)	1.00%
Lead Oxide (PbO) (Type 13)	1.00%	Lead Oxide (PbO) (Type 13)	1.00%
Lead Oxide (PbO) (Type 14)	1.00%	Lead Oxide (PbO) (Type 14)	1.00%
Lead Oxide (PbO) (Type 15)	1.00%	Lead Oxide (PbO) (Type 15)	1.00%
Lead Oxide (PbO) (Type 16)	1.00%	Lead Oxide (PbO) (Type 16)	1.00%
Lead Oxide (PbO) (Type 17)	1.00%	Lead Oxide (PbO) (Type 17)	1.00%
Lead Oxide (PbO) (Type 18)	1.00%	Lead Oxide (PbO) (Type 18)	1.00%
Lead Oxide (PbO) (Type 19)	1.00%	Lead Oxide (PbO) (Type 19)	1.00%
Lead Oxide (PbO) (Type 20)	1.00%	Lead Oxide (PbO) (Type 20)	1.00%
Lead Oxide (PbO) (Type 21)	1.00%	Lead Oxide (PbO) (Type 21)	1.00%
Lead Oxide (PbO) (Type 22)	1.00%	Lead Oxide (PbO) (Type 22)	1.00%
Lead Oxide (PbO) (Type 23)	1.00%	Lead Oxide (PbO) (Type 23)	1.00%
Lead Oxide (PbO) (Type 24)	1.00%	Lead Oxide (PbO) (Type 24)	1.00%
Lead Oxide (PbO) (Type 25)	1.00%	Lead Oxide (PbO) (Type 25)	1.00%
Lead Oxide (PbO) (Type 26)	1.00%	Lead Oxide (PbO) (Type 26)	1.00%
Lead Oxide (PbO) (Type 27)	1.00%	Lead Oxide (PbO) (Type 27)	1.00%
Lead Oxide (PbO) (Type 28)	1.00%	Lead Oxide (PbO) (Type 28)	1.00%
Lead Oxide (PbO) (Type 29)	1.00%	Lead Oxide (PbO) (Type 29)	1.00%
Lead Oxide (PbO) (Type 30)	1.00%	Lead Oxide (PbO) (Type 30)	1.00%
Lead Oxide (PbO) (Type 31)	1.00%	Lead Oxide (PbO) (Type 31)	1.00%
Lead Oxide (PbO) (Type 32)	1.00%	Lead Oxide (PbO) (Type 32)	1.00%
Lead Oxide (PbO) (Type 33)	1.00%	Lead Oxide (PbO) (Type 33)	1.00%
Lead Oxide (PbO) (Type 34)	1.00%	Lead Oxide (PbO) (Type 34)	1.00%
Lead Oxide (PbO) (Type 35)	1.00%	Lead Oxide (PbO) (Type 35)	1.00%
Lead Oxide (PbO) (Type 36)	1.00%	Lead Oxide (PbO) (Type 36)	1.00%
Lead Oxide (PbO) (Type 37)	1.00%	Lead Oxide (PbO) (Type 37)	1.00%
Lead Oxide (PbO) (Type 38)	1.00%	Lead Oxide (PbO) (Type 38)	1.00%
Lead Oxide (PbO) (Type 39)	1.00%	Lead Oxide (PbO) (Type 39)	1.00%
Lead Oxide (PbO) (Type 40)	1.00%	Lead Oxide (PbO) (Type 40)	1.00%
Lead Oxide (PbO) (Type 41)	1.00%	Lead Oxide (PbO) (Type 41)	1.00%
Lead Oxide (PbO) (Type 42)	1.00%	Lead Oxide (PbO) (Type 42)	1.00%
Lead Oxide (PbO) (Type 43)	1.00%	Lead Oxide (PbO) (Type 43)	1.00%
Lead Oxide (PbO) (Type 44)	1.00%	Lead Oxide (PbO) (Type 44)	1.00%
Lead Oxide (PbO) (Type 45)	1.00%	Lead Oxide (PbO) (Type 45)	1.00%
Lead Oxide (PbO) (Type 46)	1.00%	Lead Oxide (PbO) (Type 46)	1.00%
Lead Oxide (PbO) (Type 47)	1.00%	Lead Oxide (PbO) (Type 47)	1.00%
Lead Oxide (PbO) (Type 48)	1.00%	Lead Oxide (PbO) (Type 48)	1.00%
Lead Oxide (PbO) (Type 49)	1.00%	Lead Oxide (PbO) (Type 49)	1.00%
Lead Oxide (PbO) (Type 50)	1.00%	Lead Oxide (PbO) (Type 50)	1.00%
Lead Oxide (PbO) (Type 51)	1.00%	Lead Oxide (PbO) (Type 51)	1.00%
Lead Oxide (PbO) (Type 52)	1.00%	Lead Oxide (PbO) (Type 52)	1.00%
Lead Oxide (PbO) (Type 53)	1.00%	Lead Oxide (PbO) (Type 53)	1.00%
Lead Oxide (PbO) (Type 54)	1.00%	Lead Oxide (PbO) (Type 54)	1.00%
Lead Oxide (PbO) (Type 55)	1.00%	Lead Oxide (PbO) (Type 55)	1.00%
Lead Oxide (PbO) (Type 56)	1.00%	Lead Oxide (PbO) (Type 56)	1.00%
Lead Oxide (PbO) (Type 57)	1.00%	Lead Oxide (PbO) (Type 57)	1.00%
Lead Oxide (PbO) (Type 58)	1.00%	Lead Oxide (PbO) (Type 58)	1.00%
Lead Oxide (PbO) (Type 59)	1.00%	Lead Oxide (PbO) (Type 59)	1.00%
Lead Oxide (PbO) (Type 60)	1.00%	Lead Oxide (PbO) (Type 60)	1.00%
Lead Oxide (PbO) (Type 61)	1.00%	Lead Oxide (PbO) (Type 61)	1.00%
Lead Oxide (PbO) (Type 62)	1.00%	Lead Oxide (PbO) (Type 62)	1.00%
Lead Oxide (PbO) (Type 63)	1.00%	Lead Oxide (PbO) (Type 63)	1.00%
Lead Oxide (PbO) (Type 64)	1.00%	Lead Oxide (PbO) (Type 64)	1.00%
Lead Oxide (PbO) (Type 65)	1.00%	Lead Oxide (PbO) (Type 65)	1.00%
Lead Oxide (PbO) (Type 66)	1.00%	Lead Oxide (PbO) (Type 66)	1.00%
Lead Oxide (PbO) (Type 67)	1.00%	Lead Oxide (PbO) (Type 67)	1.00%
Lead Oxide (PbO) (Type 68)	1.00%	Lead Oxide (PbO) (Type 68)	1.00%
Lead Oxide (PbO) (Type 69)	1.00%	Lead Oxide (PbO) (Type 69)	1.00%
Lead Oxide (PbO) (Type 70)	1.00%	Lead Oxide (PbO) (Type 70)	1.00%
Lead Oxide (PbO) (Type 71)	1.00%	Lead Oxide (PbO) (Type 71)	1.00%
Lead Oxide (PbO) (Type 72)	1.00%	Lead Oxide (PbO) (Type 72)	1.00%
Lead Oxide (PbO) (Type 73)	1.00%	Lead Oxide (PbO) (Type 73)	1.00%
Lead Oxide (PbO) (Type 74)	1.00%	Lead Oxide (PbO) (Type 74)	1.00%
Lead Oxide (PbO) (Type 75)	1.00%	Lead Oxide (PbO) (Type 75)	1.00%
Lead Oxide (PbO) (Type 76)	1.00%	Lead Oxide (PbO) (Type 76)	1.00%
Lead Oxide (PbO) (Type 77)	1.00%	Lead Oxide (PbO) (Type 77)	1.00%
Lead Oxide (PbO) (Type 78)	1.00%	Lead Oxide (PbO) (Type 78)	1.00%
Lead Oxide (PbO) (Type 79)	1.00%	Lead Oxide (PbO) (Type 79)	1.00%
Lead Oxide (PbO) (Type 80)	1.00%	Lead Oxide (PbO) (Type 80)	1.00%
Lead Oxide (PbO) (Type 81)	1.00%	Lead Oxide (PbO) (Type 81)	1.00%
Lead Oxide (PbO) (Type 82)	1.00%	Lead Oxide (PbO) (Type 82)	1.00%
Lead Oxide (PbO) (Type 83)	1.00%	Lead Oxide (PbO) (Type 83)	1.00%
Lead Oxide (PbO) (Type 84)	1.00%	Lead Oxide (PbO) (Type 84)	1.00%
Lead Oxide (PbO) (Type 85)	1.00%	Lead Oxide (PbO) (Type 85)	1.00%
Lead Oxide (PbO) (Type 86)	1.00%	Lead Oxide (PbO) (Type 86)	1.00%
Lead Oxide (PbO) (Type 87)	1.00%	Lead Oxide (PbO) (Type 87)	1.00%
Lead Oxide (PbO) (Type 88)	1.00%	Lead Oxide (PbO) (Type 88)	1.00%
Lead Oxide (PbO) (Type 89)	1.00%	Lead Oxide (PbO) (Type 89)	1.00%
Lead Oxide (PbO) (Type 90)	1.00%	Lead Oxide (PbO) (Type 90)	1.00%
Lead Oxide (PbO) (Type 91)	1.00%	Lead Oxide (PbO) (Type 91)	1.00%
Lead Oxide (PbO) (Type 92)	1.00%	Lead Oxide (PbO) (Type 92)	1.00%
Lead Oxide (PbO) (Type 93)	1.00%	Lead Oxide (PbO) (Type 93)	1.00%
Lead Oxide (PbO) (Type 94)	1.00%	Lead Oxide (PbO) (Type 94)	1.00%
Lead Oxide (PbO) (Type 95)	1.00%	Lead Oxide (PbO) (Type 95)	1.00%
Lead Oxide (PbO) (Type 96)	1.00%	Lead Oxide (PbO) (Type 96)	1.00%
Lead Oxide (PbO) (Type 97)	1.00%	Lead Oxide (PbO) (Type 97)	1.00%
Lead Oxide (PbO) (Type 98)	1.00%	Lead Oxide (PbO) (Type 98)	1.00%
Lead Oxide (PbO) (Type 99)	1.00%	Lead Oxide (PbO) (Type 99)	1.00%
Lead Oxide (PbO) (Type 100)	1.00%	Lead Oxide (PbO) (Type 100)	1.00%

FORMULA 8-10

This is a general purpose primer that has performed especially well in marine atmospheres.

This paint should be applied on thoroughly cleaned surfaces.

Composition	Pounds	Pounds	Gallons
PIGMENT: Red Lead (97% Grade)	85.0	875	7.77
Basic Lead Chromate	30.0	312	4.43
Zinc Oxide	10.0	105	1.23
Magnesium Silicate	10.0	105	4.43
Dioctadecanoic Sls	5.0	50.7	5.14
	100.0		
VEHICLE: Dehydrated Castor Oil Alkyd*	100.0	885	78.00
	100.0	1041.7	100.00

Pigment = 94.65
Vehicle = 85.65
Wt./Vol. = 18.4 lbs.
PV = 408

* The preparation and properties of this vehicle are described in detail under Formula 8-7 on page 8.

FORMULA 8-11

(U. S. Maritime Commission Specification 52-MC-801)

When applied to clean steel this primer will give excellent service when exposed to the atmosphere, particularly in marine environments.

Composition	Pounds	Pounds	Gallons
PIGMENT: Red Lead (F.S. TT-P-101a, Type I, Grade C)....	85.4	888	8.14
Zinc Yellow (F.S. TT-Z-41R, Type I)	10.2	78	2.51
Mica	8.4	85	2.41
Indian Red	1.4	18	0.30
Magnesium Silicate (52-MC-802, Type I)*	23.3	180	6.70
Aluminum Stearate	0.3	2	0.34
	100.0		
VEHICLE: Alkyd Resin (52-MC-801, Type I)*	80.0	415	35.80
Aromatic Naphtha (Type III)	14.7	105	14.00
Petroleum Spirits (F.S. TT-T-301a, Grade II)	17.3	110	17.00
	100.0	1517	100.00

Note: Litharge may be added as desired up to 6 pounds per 100 gallons.

Pigment = 885
Vehicle = 408
Wt./Vol. = Not under 12.5 lbs.
PV = 325

* 52-MC-801 - A based oil modified glyceryl phthalate alkyd.

Non-Volatile = 70 to 75
Wt./Vol. = 8 lbs.
Potentially Alkyd-like = not under 500