

LEAD INDUSTRIES ASSOCIATION

480 LEXINGTON AVENUE

NEW YORK 17, N. Y.

Pigments and Chemicals Division

RED LEAD TECHNICAL COMMITTEE

Pittsburgh, Pa.

January 27, 1954

A meeting of the Red Lead Technical Committee was held at the Webster Hall Hotel, Pittsburgh, Pa., on January 27, 1954. The following attended:

<u>Name</u>	<u>Representing</u>
Mr. Paul Whitford	The Eagle-Picher Company
Mr. G. F. Shobe	The Glidden Company
Dr. J. O. Johnstone	Hammond Lead Products, Inc.
Mr. C. J. Vander Valk	Hammond Lead Products, Inc.
Mr. R. F. Bates	National Lead Company
Dr. L. L. Carrick, Director of Red Lead Research, Chairman	
Mr. R. L. Eiegfeld, Secretary-Treasurer, Lead Industries Association	
Mr. C. E. Cherry Jr., Secretary to the Committee	

The meeting commenced at 10:00 A.M. Minutes of the previous meeting of June 25 and 26, 1953 were approved.

TECHNICAL CORRESPONDENCE

Pending correspondence requiring consideration by the Committee was discussed and disposed of as follows:

1. Request from the Metaloid Products Co. that the Committee investigate the use of metallic leafed lead in red lead paints.

This inquiry resulted from the inclusion of a red lead-zinc dust formulation in Technical Letter No. 6. After comments on past knowledge of flaked lead in paint the Committee agreed to set up test panels for further investigation. Four paints, formulated as listed below, were selected for a comparative test. The panels will be exposed at Joplin, Mo. at an early date.

a. Pacific Telephone and Telegraph Co. specification 2-1536;

Red Lead Paste (7% Linseed Oil).....	100.	pounds
Metallic Leafed Lead Paste.....	15.	"
Lamp Black Paste.....	0.75	"
Raw Linseed Oil.....	2.85	gallons
Drier.....	1.	pint
Mineral Spirits.....	1.	"

The metallic leafed lead paste and the red lead shall be ground in oil together.

The weight per gallon of the above paint shall be not less than 24 lbs.



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- b. Formula 6-27, Red Lead Technical Letter No. 6 (red lead-sine dust pigment).
- c. Formula 6-27, Red Lead Technical Letter No. 6, with flaked lead substituted for sine dust in equal weight.
- d. Fed. Spec. TT-P-641, Class B, Type II, (Zinc oxide-sine dust pigment)

2. Correspondence between Signal Section, Association of American Railroads and Mr. R. W. Baker, formerly connected with the Paint Division of the National Lead Co.

This correspondence was turned over to the Pigments and Chemicals Division of the L.I.A. on the assumption it would be interested in cooperating with the railroad sub-committee in its work on painting. The Committee agreed that the possibilities in working with the railroad committee were worthwhile and that contact with the Signal Section should be originated from the offices of the L.I.A. as the first step in implementing mutually beneficial efforts in the future.

3. Inquiry from the International Salt Co. concerning the use of Dumesque's Diolate in red lead paints.

The Committee members had no detailed knowledge of this use of Dumesque's Diolate beyond that it is used by some paint manufacturers. Mr. Bates was aware of some work that had been done on the compound and promised to forward to the Committee such information as he could uncover.

EXPANSION OF TECHNICAL LETTER NO. 8

Technical Letter No. 8, originally restricted to primers for railroad structures, was expanded by the Committee to include two formulations for railroad rolling stock that were to have been the material for the new Technical Letter mentioned as Item 2 on the agenda for this meeting. Additionally, a note concerning the substitution of Pentone 34 for aluminum stearate in all formulations was added to the letter (cf. Item 4 on the agenda). The title of Technical Letter No. 8 now reads "Primers for Railroad Structures and Rolling Stock." The letter was finalized by the Committee and is ready for printing. A copy of the corrected and expanded letter as it will be published is appended to these minutes.

REPORT ON PROGRESS OF NAVY WELDING PROJECT AT HARVARD SCHOOL OF PUBLIC HEALTH

Mr. Ziegfeld reported that the laboratory phase of the joint Navy-L.I.A. Welding project was completed in November. He stated that Dr. Silverman had promised us an informal report on this phase of the work, which has not yet been received. However, it is known, from personal contact, that the results indicate that, where red lead painted steel is welded, approximately twice the ventilation required by the Navy's minimum standard would be needed with the present maximum allowable concentration.

The Association was recently informed that the field test phase of the work has been approved by the Navy and should get under way at the Boston Navy Yard shortly.

Mr. Ziegfeld pointed out that despite the comparatively unfavorable results in the laboratory phase of the work, the Association is morally obligated to carry out its part of the contract so long as the Navy does likewise. In that event a report would be made by Drs. Drinker and Silverman to both the Navy and

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the Lead Industries Association, but no report could be published without the approval of both. He pointed out that since Dr. Drinker is consultant to the Navy, even though no formal report were made to the Navy, the latter would certainly have access to the results through Dr. Drinker.

Mr. Ziegfeld went on to explain that an unfavorable report would not necessarily rule lead out of consideration. Navy personnel have said that even if lead required additional ventilation it might be used, at least in some instances, strictly on its merits. He also pointed out that strength of weld tests conducted at the Philadelphia Navy Yard had indicated that welding over any paint is undesirable from this standpoint and red lead even showed a slight advantage over zinc chromate in this respect. While results of the Philadelphia tests have not been accepted by the Bureau of Ships in Washington, nevertheless, a similar program is being planned by the Bureau of Ships to be conducted at the Boston Navy Yard. Should these tests confirm the Philadelphia results, it is quite possible that standard Navy practice would be changed so that all welding would be done on bare steel. In that event, red lead would be at no disadvantage.

He further stated that it may be possible that the Navy is already using ventilation rates in excess of the minimum required, in which case it might be sufficient to handle welding over red lead safely, or at least might not require so much of an increase. An attempt will be made to determine whether this is the case or not.

Furthermore, there is a movement on foot to increase the maximum allowable concentrations of lead fumes in air. Dr. Drinker has already suggested to the Committee on Threshold Limits of the American Conference of Governmental Industrial Hygienists, that the maximum allowable concentration for lead could be doubled safely and an American Standards Association Committee is also contemplating a study of the problem with the thought of possible increases in the A.S.A. maximum allowable concentration for lead. Naturally, any increase in the A.S.A. would reduce the ventilation rates required.

In view of the foregoing, Mr. Ziegfeld felt that the Association has no alternative but to await further developments in the various directions outlined.

The committee concurred with Mr. Ziegfeld.

NEXT MEETING DATE

An inspection meeting of the Committee was tentatively set for April 1 and 2, 1954 at Sayville, N. Y.

In connection with the meeting it was deemed desirable if the members could obtain prior to the meeting a preliminary rating of all L.I.A. panels at Sayville together with a summary of the last previous rating. This would implement better direction of effort at the meeting. Mr. Lominska, at the testing station, had previously agreed to do this, (cf. minutes, meeting of April 30, May 1, 1953) and will be asked to do so, his schedule permitting, before the Committee meeting.

The meeting adjourned at 4:30 P.M.

Charles E. Cherry Jr.
Charles E. Cherry Jr.
Secretary to the Committee

FEBRUARY, 1954

Red Lead Technical Letter No. 8

PRIMERS for RAILROAD
STRUCTURES and ROLLING STOCK

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Red Lead Technical Committee

LEAD INDUSTRIES ASSOCIATION
420 Lexington Avenue
New York 17, N. Y.

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FOREWORD

Aware of the keen interest of the railroad industry in the development of better and more economical paint systems for railroad structures the Red Lead Technical Committee of the Lead Industries Association has prepared this collection of high quality primer paint formulations for railroad bridges and other structures along the right-of-way. These primer paints were formulated to meet all commonly encountered surface conditions and environments.

This Technical Letter also includes two low-cost formulations designed specifically to meet the need for an improved anti-corrosive primer for steel rolling stock.

Inquiries on these formulations or on specific painting problems are welcome and should be addressed to the Lead Industries Association or to the designated individuals in the member companies listed below.

THE EAGLE-PICHER COMPANY.....American Building, Cincinnati 1, Ohio
For technical information write Paul Whitford at above address.
Chicago, Cleveland, Dallas 26, Detroit, Kansas City 6, (Mo.), New Orleans, New York 17, Philadelphia 4, Pittsburgh 22; On the Pacific Coast; Associated Lead and Zinc Company, Seattle 4, Los Angeles 21, San Francisco 7

W. P. FULLER & COMPANY.....301 Mission Street, San Francisco 1, California
For technical information write F. J. Kullenberg at above address.
Boise, Butte, Fresno, Los Angeles, Oakland, Phoenix, Portland (Ore.), Sacramento, Salt Lake City, San Diego, Seattle, Spokane, Tacoma, Yakima (Wash.)

THE GLIDDEN COMPANY.....1396 Union Commerce Building, Cleveland 14, Ohio
For technical information write O. P. Shobe at above address.
Atlanta, 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; Hubian Paint & Varnish Division, Chicago; A. Wilhelm Company Division, Reading; Canadian Division, Toronto; The Chemical & Pigment Company, Baltimore, Collinsville (Ill.), Oakland; Euston 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......5211 Hohman Avenue, Hammond, Indiana
420 Lexington Avenue, New York 17, N. Y.
For technical information write J. O. Johnstone at Hammond, Indiana.

NATIONAL LEAD COMPANY.....111 Broadway, New York 6, N. Y.
For technical information write George Diehlman at above address.
Atlanta, Buffalo 3, Chicago 8, Cincinnati 3, Cleveland 13, Dallas 2, Philadelphia 25, Pittsburgh 12, St. Louis 1, San Francisco 10, National Lead Company of Mass., Boston 6

WESTERN LEAD PRODUCTS COMPANY...4530 E. Pacific Way, Los Angeles 22, California
1235 Fourth Street, Berkeley 2, California
For technical information write Thomas B. Blair at Los Angeles, California

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RED LEAD PAINT FORMULATIONS FOR STRUCTURES

FOR STEEL CONTAINING MILL SCALE AND
RESIDUAL RUST (Slow Dry)

The following three 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. The free linseed oil content of these paint vehicles assures the degree of wetting ability needed for good anchorage to a heterogeneous surface.

Formula 8-10

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

<u>Composition</u>	<u>Percent</u>	<u>Pounds</u>	<u>Gallons</u>
PIGMENT: Red Lead (Fed. Spec. TT-R-191, Type 1, Class C).....	99.7	1860.0	26.0
Aluminum Stearate.....	0.3	5.5	0.6
	100.0		
VEHICLE: Raw Linseed Oil (Fed. Spec. TT-O-369)..	49.0	262.0	35.0
Pale Heat Bodied Linseed Oil (Fed. Spec. TT-O-367, Type II) 2-2 Viscosity.....	17.0	91.0	11.5
Mineral Spirits (Fed. Spec. TT-T-291, Grade 1).....	29.0	154.5	23.5
Liquid Driers (Fed. Spec. TT-U-651a, Type I).....	5.0	26.5	3.4
	100.0	2399.5	100.0

Pigment = 77.8%
Vehicle = 22.2%
Wt./Gal. = 24 lbs
PV = 36

Dry for handling - about 24 hours
Dry for recoating - about 36 hours

*Conforms to the following specifications:
Federal Specification TT-P-86a, Type I
American Association of State Highway Officials M78-49, Type II

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Formula 8-2*

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

<u>Composition</u>	<u>Percent</u>	<u>Pounds</u>	<u>Gallons</u>
PIGMENT: Red Lead, 95% Grade.....	75.0	735.0	9.9
Magnesium Silicate.....	14.7	144.0	6.1
Diatomaceous Silica.....	10.0	98.0	5.9
Aluminum Stearate.....	0.3	3.0	0.3
	100.0		
VEHICLE: Raw Linseed Oil.....	40.0	230.0	29.7
Pale Heat Bodied Linseed Oil (2-2 Viscosity)**.....	25.0	144.0	18.0
Petroleum Spirits.....	30.0	173.6	26.3
Liquid Driers.....	5.0	28.7	3.8
	100.0	1556.3	100.0

Pigment = 63%
 Vehicle = 37%
 Wt./Gal. = 15.5 lbs.
 PV = 32

Dry for handling - about 24 hours
 Dry for recoating - about 36 hours

*Conforms to the following specifications:
 Southern Railway Specification 48-B
 Steel Structures Painting Council Specification SSPC-P6-53P
 ** Federal Specification T2-C-367, Type II

Formula 8-3*

This is a lower cost formulation useful as a maintenance or intermediate coat under mild exposure conditions.

<u>Composition</u>	<u>Percent</u>	<u>Pounds</u>	<u>Gallons</u>
PIGMENT: Red Lead, 95% Grade.....	45.0	339.0	4.6
Zinc Yellow.....	16.0	121.0	4.2
Siliceous Iron Oxide, 70% Fe ₂ O ₃	16.0	121.0	3.3
Magnesium Silicate.....	23.0	173.0	7.3
	100.0		
VEHICLE: Heat Treated Oils.....	60.0	356.0	45.2
Mineral Spirits.....	32.0	190.0	29.2
Japan Driers.....	8.0	47.0	6.2
	100.0	1347.0	100.0

Pigment = 56%
 Vehicle = 44%
 Wt./Gal. = 13.5 lbs.
 PV = 30

Dry for handling - about 24 hours
 Dry for recoating - about 36 hours

*Conforms to the following specifications:
 Chicago and Northwestern Railway Company Standard Paint No. 2

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**FOR STEEL CONTAINED 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.

Formula 8-4*

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

<u>Composition</u>	<u>Percent</u>	<u>Pounds</u>	<u>Gallons</u>
PIGMENT: Red Lead (Fed. Spec. TT-R-191a, Type I Class B).....	76.1	1290.0	17.0
Iron Oxide (Fed. Spec. TT-M-381).....	23.6	400.0	10.5
Aluminum Stearate (Navy Spec. S2-A-12a)	0.3	5.6	0.5
	<u>100.0</u>		
VEHICLE: Raw Linseed Oil (Fed. Spec. TT-O-369)..	56.3	318.0	41.0
Alkyd Resin Solution (Fed. Spec. TT-R-266, Type II, Class A)**.....	30.6	173.0	21.0
Petroleum Spirits and Driers.....	13.1	74.0	10.0
	<u>100.0</u>	<u>2260.6</u>	<u>100.0</u>

Pigment = 75%
Vehicle = 25%
Wt./Gal. = 22 lbs.
PV = 35

Dry for handling - about 16 hours
Dry for recoating - about 24 hours

*Conforms to the following specifications:
Bethlehem Steel Specification 7525-F8C-51
Steel Structures Painting Council SSPC -F2-53T

**Linseed modified glyceryl phthalate alkyd resin solution containing a minimum 23% phthalic anhydride in solids, 30% petroleum spirits by weight.

Formula 8-5⁰

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

<u>Composition</u>	<u>Percent</u>	<u>Pounds</u>	<u>Gallons</u>
FIGMENT: Red Lead (Fed. Spec. TT-R-191, Type 1, Class C).....	65.0	716.0	9.7
Siliceous Iron Oxide, 85% Fe ₂ O ₃	15.0	165.0	4.4
Magnesium Silicate.....	14.7	162.0	4.8
Mica, 325 Mesh.....	5.0	55.0	2.3
Aluminum Stearate.....	0.3	3.3	0.4
	<u>100.0</u>		
VEHICLE: Alkyd Resin Solution (Fed. Spec. TT-R-366, Type III)**.....	56.0	317.0	41.7
Raw Linseed Oil (Fed. Spec. TT-O-369).....	28.0	159.0	20.5
Petroleum Spirits.....	14.9	87.6	11.5
Lead Naphthenate Drier (2 1/2 lb).....	0.75	4.3	0.45
Cobalt Naphthenate Drier (6% Co).....	0.35	2.0	0.25
	<u>100.0</u>	<u>1671.2</u>	<u>100.00</u>

Pigment = 666
 Vehicle = 344
 Wt./Gal. = 16.7 lbs.
 PV = 38

Dry for handling - about 8 hours
 Dry for recoating - about 16 hours

*Conforms to the following specifications:
 Federal Specification TT-P-86a, Type II
 American Association of State Highway Officials, Type III

**Linseed modified glyceryl phthalate alkyd resin solution containing 30-35% phthalic anhydride in solids, 50% petroleum spirits by weight.

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**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. These synthetic vehicle primers offer outstanding protection in industrial environments where the atmosphere is contaminated with chemical fumes.

Formula 8-6*

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.

<u>Composition</u>	<u>Percent</u>	<u>Pounds</u>	<u>Gallons</u>
PIGMENT: Red Lead (Fed. Spec. TT-B-191, Type I, Class C).....	99.7	1275.0	17.20
Aluminum Stearate.....	0.3	3.5	0.46
	100.0		
VEHICLE: Alkyd Resin Solution (Fed. Spec. TT-B-266, Type III)**.....	84.0	523.0	67.20
Aromatic Petroleum Spirits.....	14.5	90.0	13.70
Cobalt Naphthenate Drier (6% Co).....	0.3	1.9	0.20
Antioxidants and Wetting Agents.....	1.2	7.6	0.94
	100.0	1901.0	100.00

Pigment = 67.3%
Vehicle = 32.7%
Wt./Gal. = 19 lbs.
PV = 36

Dry for handling - about 1 hour
Dry for recoating - about 4 hours

*Conforms to the following specifications:

Federal Specification TT-P-86a, Type III

**Linseed modified glyceryl phthalate alkyd resin solution containing 30-35% phthalic anhydride in solids, 50% petroleum spirits by weight.

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Formula 8-7*

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

<u>Composition</u>	<u>Percent</u>	<u>Pounds</u>	<u>Gallons</u>
PIGMENT: Red Lead (Fed. Spec. TT-B-191, Type I, Grade B).....	55.0	300.0	5.13
Zinc Yellow (Fed. Spec. TT-Z-415)...	10.1	70.0	2.33
Mica (Navy Dept. Spec. 52M3).....	9.4	65.0	2.77
Indian Red (Fed. Spec. TT-I-511, Type I).....	1.5	10.0	0.23
Magnesium Silicate (Navy Dept. Spec. 52M2, Type A).....	21.1	160.0	6.70
Aluminum Stearate (Navy Dept. Spec. 52A12).....	0.9	6.0	0.71
	100.0		
VEHICLE: Alkyd Resin Solution (Fed. Spec. TT-R-266 Type I, Class A)**.....	64.9	415.0	52.00
Dipentene (Fed. Spec. TT-D-376)....	3.9	25.0	3.52
Paint Thinner (Fed. Spec. TT-T-291, Grade 1).....	29.6	190.0	29.20
Lead Drier (Fed. Spec. TT-D-643, Type I).....	0.8	4.7	0.49
Cobalt Drier (Fed. Spec. TT-D-643, Type II).....	0.8	4.7	0.52
	100.0	1330.4	103.67

Pigment = 50%

Vehicle = 50%

Wt./Gal. = 12.6 lbs.

PV = 35.1

Set to touch - 2 hours

Dry hard - 6 hours

*Conforms to the following specification:

Bureau of Ships Paint Formula No. 116, MTL-P-17545 (SWIPS)

**30% modified glyceryl phthalate alkyd resin solution containing a minimum 23% phthalic anhydride in solids, 30% petroleum spirits by weight.

NOTE: This paint is very similar in composition and approximates the performance of United States Maritime Administration Specification 52-MA-201a.

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RED LEAD PAINT 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.

Formula 8-8

<u>Composition</u>	<u>Percent</u>	<u>Pounds</u>	<u>Gallons</u>
PIGMENT: Red Lead, 97% Grade.....	39.4	258.5	3.5
Zinc Yellow.....	6.9	45.1	1.5
Siliceous Iron Oxide, 70-76% Fe_2O_3	27.8	182.4	5.0
Magnesium Silicate.....	25.9	170.3	7.2
	100.0		
VEHICLE: Ester Gum Varnish.....	43.0	281.5	36.2
Heat Bodied Linseed Oil (2-2 Viscosity)	22.0	133.3	14.1
Mineral Spirits and Naphthenate Driers.	35.0	212.4	32.5
	100.0	1263.5	100.0
Pigment = 51.9%			
Vehicle = 48.1%			
Wt/Gal. = 12.6			
PV = 38			

Dry for handling - 4 to 6 hours
 Dry for recoating - about 18 hours

* 25 Gal. Ester Gum Dehydrated Castor Oil Varnish, 43% H.V.

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Formula 8-9

<u>Composition</u>	<u>Percent</u>	<u>Pounds</u>	<u>Gallons</u>
PIGMENT: Red Lead, 97% Grade.....	25.0	131.0	1.8
Zinc Yellow.....	20.0	105.0	3.6
Zinc Oxide.....	15.0	78.0	1.7
Siliceous Iron Oxide, 70-76% Fe ₂ O ₃ ..	20.0	105.0	2.9
Magnesium Silicate.....	20.0	105.0	4.4
	100.0		
VEHICLE: Ester Gum Varnish*.....	35.0	215.0	29.7
Heat Bodied Linseed Oil (2-2 Viscosity)	18.0	111.0	11.7
Mineral Spirits and Naphthenate Driers.	47.0	269.0	44.2
	100.0	1139.0	100.0

Pigment = 46%

Vehicle = 54%

Wt./Gal. = 11.4

PV = 39

Dry for handling - 4 to 6 hours
 Dry for recoating - about 18 hours

*25 Gal. Ester Gum Dehydrated Castor Oil Varnish, 43% H.V.

NOTE: In all of the formulations presented in this Technical Letter, except where paint is formulated specifically to meet a designated specification, Bentone 3L may be used for suspension and resistance to sagging instead of aluminum stearate, in approximately equal amount.