

NATIONAL LEAD COMPANY

Atlantic Branch

Lined Products Division

111 BROADWAY, NEW YORK, N. Y.

PRODUCTS

"United" Chemical Lead Lined:
Pipe, Fittings, Valves, Coils, Tank Connections.
"United" Hard Lead:
Acid Pumps, Fittings, Valves, Plug Cocks, Bibbs.
"United" Tin Lined:
All the above products can be furnished Block Tin Lined.

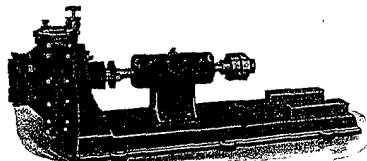
SERVICE

Actual service records are on file testifying to the satisfactory results secured from installations of "United" Lined Products.

Our Engineering Department is prepared to offer its services to anyone having acid contact problems to solve. If blueprints or sketches are submitted we will be pleased to offer suggestions in detail as to the most economical and satisfactory use of "United" Lined Products.

"UNITED" HARD LEAD CENTRIFUGAL ACID PUMPS

"United" Acid Pumps, after careful consideration by competent engineers, have been frequently selected for use in places where high efficiency was required and repairs were almost impossible.



"UNITED" HARD LEAD CENTRIFUGAL ACID PUMP

Self-lubricating with large internal grease glands supplied by compression grease cup. Outside bearings self-oiling and equipped with self-aligning thrust bearing with thrusts running in oil and properly housed. The case is of solid hard lead with the impeller of the same alloy cast around a reinforcing bronze spider. The shaft is of Monel.

"UNITED TUBOND" CHEMICAL LEAD LINED STEEL PIPE AND FLANGED FITTINGS

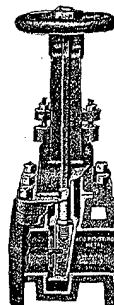
"United Tubond" Chemical Lead Lined Pipe is lined with a seamless chemical lead tube inseparably bonded to the outer casing. This "United" Method gives an absolutely uniform lining and a smooth interior surface with friction reduced to a minimum; also a lining free from porous or defective spots.

"UNITED TUBOND" CHEMICAL LEAD LINED FLANGED PIPE AND FITTING

Flanged pipe is made up with the bonded chemical lead lining made on to the lead face of the recessed flange, which gives a positive lead-to-lead joint at each flange.

Flanged pipe is made up with the bonded chemical lead lining made on to the lead face of the recessed flange, which gives a positive lead-to-lead joint at each flange.

"UNITED" HARD LEAD OR TIN LINED ACID VALVES



"UNITED" CHEMICAL HARD LEAD LINED WEDGE TYPE FLANGED ACID VALVE

"United" Acid Valves are heavily lined throughout with hard lead or pure block tin, and being constructed of iron, offer the strength of the cast iron valve with full acid resisting qualities.

"United" Acid Valves are made in all required sizes and styles: globe, gate, angle, check, diaphragm and free flow "Y" type; also special valves according to specifications.

"United" Acid Valves are always tight when closed, and by seating at the top when opened, pressure is taken from the stuffing box.

The "United" Hard Lead Lined Wedge Type Gate Pattern Flanged Acid Valve is a most efficient gate pattern of acid valve. It was especially designed for work where a drip-proof valve is necessary. You can be sure that this valve is positively tight when closed. The wedge is recessed to take a bakelite or rubber disc on the wet side. The use of either disc eliminates any rubbing or abrasive action. A perfect seat is assured at all times.

"UNITED" HARD LEAD "CHEM-RAYON" FLANGED ACID VALVES

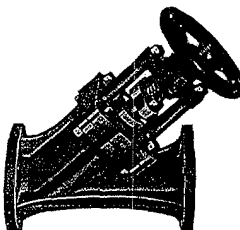
"United" Hard Lead Chem-Rayon Y or Angle Plug and Seat or Disc Type Flanged Acid Valve has a bonnet of steel and brass which is completely covered with hard lead with the exception of the hand wheel and bushing support.

The stuffing box is deeper than is customarily found in acid valves, while the gland is of hard lead. The bonnet is completely corrosion resistant which does away with the necessity of frequent costly replacements.

The body is of solid hard lead with reinforcing fins cast in the side, affording the maximum strength, while reducing the weight to a minimum.

In place of the usual lead plug or disc, rubber can be supplied.

"United" Hard Lead Acid Valves can be furnished in the same pattern as "United" Lined Valves, i. e., Y, Angle, Gate, etc., as well as special sizes and types according to specifications.



"UNITED" HARD LEAD CHEM-RAYON Y PLUG AND SEAT FLANGED VALVE

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STEAM JACKETED VACUUM AGITATOR TANK, 5 FEET IN DIAMETER AND 8 FEET HIGH, WITH 1/2 INCH HOMOGENEOUS CHEMICAL LEAD LINING

INTERIOR VIEW, STEAM JACKETED TANK, 6 1/2 FEET IN DIAMETER AND 7 FEET HIGH, SHOWING BREAKERS WITH 1/2 INCH HOMOGENEOUS CHEMICAL LEAD LINING AND COVERING



TYPES A AND D CONCENTRATORS

the services of our engineering staff are at your disposal either for consultation or for submitting definite quotations based on your specifications.

Continued on Next Page

The National Lead Company has the exclusive rights to build and sell concentrating plants and give licenses for the Simonson-Mantius Vacuum Process. Inquiries should be directed to the National Lead Company, Acid Recovery Department, 111 Broadway, New York.

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NATIONAL LEAD COMPANY

Atlantic Branch

Lined Products Division

SELLING AGENTS FOR THE TREADWELL CONSTRUCTION CO., MIDLAND, PA.

111 BROADWAY, NEW YORK, N. Y.

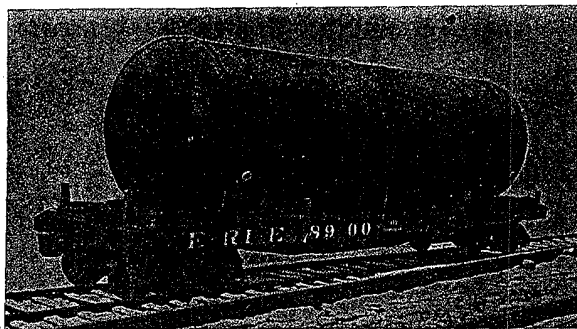
PRODUCTS

Homogeneous Lead Lined Vacuum Apparatus, Evaporators, Tanks, Steam Jacketed Kettles, Acid Eggs, Digesters, Autoclaves, Agitators, Pressure Stills, Treater Drums and Tank Cars. Homogeneous Lead Covered Heating or Cooling Coils; also Agitating Apparatus of any design.

ADVANTAGES OF PROCESS

The chemical lead lining or covering is of uniform thickness and inseparably bonded to the base metal which may be steel, iron, copper or brass, forming a flawless and impervious protective surface.

A strip of steel covered with chemical lead by this process can be mechanically twisted to destruction



ONE OF FOUR TREATER DRUMS EACH 10 FEET IN DIAMETER BY 30 FEET LONG FABRICATED OF ONE INCH STEEL SHELL, 1/4 INCH HEADS OF WELDED CONSTRUCTION FOR 125 POUNDS WORKING PRESSURE WITH 1/4 INCH HOMOGENEOUS CHEMICAL LEAD LINING PURCHASED FOR REFINERY USE

without the slightest shearing action between the lead and the steel.

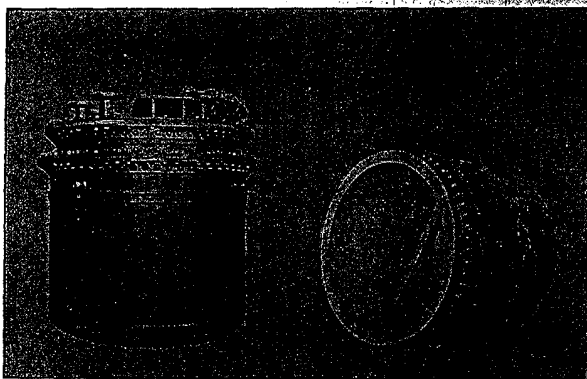
Continuous unbroken surface of lining or covering gives strength and durability under pressure, vacuum or high temperature.

Our improved method of application assures a bond that will not come loose under conditions of shock, vibration or pressure.

The chemical lead bonding is not affected up to temperatures within a few degrees of the melting point of the lead.

All homogeneously lined equipment is fabricated to your individual specifications. In this connection, the services of our engineering staff are at your disposal either for consultation or for submitting definite quotations based on your specifications.

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STEAM JACKETED VACUUM AGITATOR TANK, 6 FEET IN DIAMETER AND 6 FEET HIGH, WITH 1/4 INCH HOMOGENEOUS CHEMICAL LEAD LINING

INTERIOR VIEW, STEAM JACKETED TANK, 6 1/2 FEET IN DIAMETER AND 7 FEET HIGH, SHOWING BLADES WITH 1/4 INCH HOMOGENEOUS CHEMICAL LEAD LINING AND COVERING



TYPES A AND D CONCENTRATORS

The National Lead Company has the exclusive rights to build and sell concentrating plants and give licenses for the Simonson-Mantius Vacuum Process. Inquiries should be directed to the National Lead Company, Acid Recovery Department, 111 Broadway, New York.

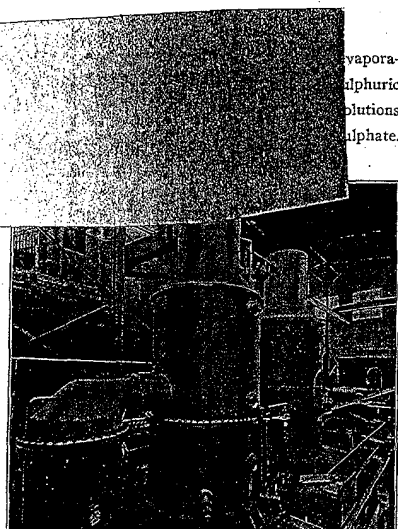
However, spent acids should be practically free from nitric acid to prevent excessive corrosion of the lead vapor lines and condenser.

Chamber Acid Plants—Sulphuric acid manufactured by the standard lead chamber process has a density of from 56 to 58° Be., and therefore requires further concentration to 66° Be. This work can be done economically under vacuum, as the fuel consumption is low and the loss of acid very small compared with losses usually encountered in the old-fashioned pan and bench or tower system.

Under normal conditions the 56° acid can be concentrated to 66° Be. at a total cost of from \$1 to \$1.50 per ton of 66° acid.

SEPARATING PLANTS FOR SLUDGE ACID

We are prepared to design and furnish complete plants for the separation of sludge acid; where necessary, we also build special equipment for the complete absorption of all fumes and odors coming from separating plants.



TYPES A AND D CONCENTRATORS

INSTALLATIONS

We have in operation or under construction the following plants:

Sludge Acid Concentrators	Units
Atlantic Refining Company.....	4
Bethlehem Steel Company.....	1
Empire Refineries.....	3
Gulf Refining Company.....	19
Houston Oil & Refining Co.....	1
Indian Refining Company.....	3
Lincoln Oil Refining Co.....	1
Marland Refining Company.....	3
Pure Oil Company.....	4
Roxana Petroleum Corp.....	2
Sharples Solvents Corp.....	1
Simon Carves, Ltd.....	1
Sinclair Refining Co.....	1
Standard Oil Co. of Indiana.....	2
Standard Oil Co. of N. J.....	4
Standard Oil Co. of Ohio.....	2
The Texas Company.....	2
Union Oil Company of Cal.....	2
Utah Oil Refining Co.....	1
Vacuum Oil Company.....	10

Specialty Plants	Units
Nichols Copper Company.....	1
Titanium Pigment Co.....	1
Tubize Artificial Silk Co. of America.....	5
Westvaco Chlorine Products, Inc.....	1

Chamber Acid Concentrator	Units
Hard Chemical Works.....	1

Sludge Acid Separating Plants	Units
Cities Service Refining Co.....	1
Lincoln Oil Refining Co.....	1
Shell Company of Cal.....	2

The above installations represent a combined daily capacity of over 2600 tons of finished acid and 900 barrels of sludge. Eleven of these installations are of the SUPER VACUUM type.

INQUIRIES

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NATIONAL LEAD COMPANY

Member of the Producers' Council, Inc.

Paint Materials for the Protection and Decoration of Wood, Plaster, Brick, Stone, Concrete, Stucco, Metal

NEW YORK, N. Y., 111 Broadway
BOSTON, MASS., National-Boston Lead Co., 800 Albany Street
BUFFALO, N. Y., 116 Oak Street
CHICAGO, ILL., 900 West 18th Street
CINCINNATI, OHIO, 659 Freeman Avenue
CLEVELAND, OHIO, 820 West Superior Avenue

PHILADELPHIA, PA., John T. Lewis & Bros. Co., Widener Building
PITTSBURGH, PA., National Lead & Oil Co., 316 Fourth Avenue
ST. LOUIS, MO., 722 Chestnut Street
SAN FRANCISCO, CAL., 2240 24th Street

Dutch Boy Products

Dutch Boy All Purpose Soft Paste White-Lead—This is a soft paste or quick-mixing white-lead which, as its name signifies, is equally suitable for inside or outside use. Mixed with flating oil, it flats perfectly, giving a beautiful, washable interior finish free from "flashes" or shiny places. Mixed with linseed oil, it produces the fine type of durable exterior gloss finish always associated with pure white-lead. Moreover, it is whiter and smoother, thus making for whiter whites, clearer tints, better all-around appearance.

Dutch Boy White-Lead is also obtainable in the old-style heavy paste form, which differs in composition from the all-purpose soft paste only in that it contains no turpentine. Both are pure "lead-in-oil." It is the turpentine in the latter product, plus extra milling, that gives the quick-mixing qualities.

Dutch Boy Red-Lead-in-Oil—A very highly oxidized grade of pure red-lead ground in pure linseed oil to paste consistency. Its exceptionally high true red-lead (PbO₂) content and the fineness of its pigment particles insure a paint of excellent brushing qualities, good coverage and extreme durability.

Dutch Boy Liquid Red-Lead—A ready-to-use, pure red-lead paint weighing 28 lbs. to the gallon. Equivalent to paint made by mixing 1 1/2 gals. linseed oil with 100 lbs. Dutch Boy Red-Lead-in-Oil (paste red-lead). Composition by weight: Pure red-lead (96% true red-lead)—81%; pure raw linseed oil—18%; pure liquid drier—1%. Can also be had tinted—in light and dark brown, light and dark green, and black.

Dutch Boy Wall Primer—Dutch Boy Wall Primer is a special primer developed for use in white-lead painting. Stops suction, seals fire cracks and, at same time, serves as first coat. Possesses exceptional hiding power. Forms a tightly adhering foundation for succeeding coats of white-lead. Works equally well on all interior surfaces—plaster, wallboard, insulating board, brick, concrete.

Dutch Boy Linseed Oil—Clear, carefully filtered, well settled, pure linseed oil conforming to specifications of American Society for Testing Materials. 1 and 5-gal. sealed cans.

Dutch Boy Flating Oil—A skillfully blended flating liquid for use with white-lead to produce flat and semiflat paint for interior walls and woodwork. When white-lead is thinned with flating oil a paint results which possesses many points of excellence. It has good hiding power. It levels itself nicely. It sets slowly, so that large areas can be worked without risk of laps. It is durable and washable.

Dutch Boy Colors-in-Oil—These can be depended upon to be oil colors of the very highest grade. They were developed especially for tinting white-lead or red-lead paint.

In consistency a smooth, buttery paste, Dutch Boy colors disperse into paint quickly without lumping or streaking. Strong in tinting power, they are economical and give clean, sharp tints. Absolutely true in color tone, too.

Dutch Boy Liquid Drier—This is a properly balanced paint drier possessing every desirable quality—uniformity, strength, excellence of ingredients.

General Painting Specifications

Following are general specifications for the painting of interior and exterior surfaces:

Preparation of Surface—(1) Woodwork—New woodwork shall be cut smooth with sandpaper where required and dusted



clean before priming. From old woodwork which has been painted before, all loose paint, scale, dirt and dust shall be removed. Wash off with benzine or turpentine all parts where liquid paint remover has been used.

After the priming coat on new woodwork is applied, all knots and sappy streaks shall receive one coat of shellac varnish brushed out thin and all dents, cracks and other defects shall be filled with putty composed of white-lead and whiting.

(2) **Plaster**—Before applying any paint to plaster, either new or old, see that it is clean and smooth. Fill all cracks and holes with patching plaster. Where new plaster to be painted is not properly aged, it shall be treated before priming with a solution made by dissolving 2 lbs. of zinc sulphate in 1 gal. of water.

(3) **Brick and Stone**—New brickwork shall not be primed until dry. At least 2 or 3 days of dry weather shall precede painting. If any mortar has become loose or damaged, all such places shall be pointed with mortar before applying paint. After priming, correct small defects in the surface with putty.

(4) **Stucco and Concrete**—Stucco or concrete shall be allowed to stand and dry at least six months before paint is applied. If painted before this time, it shall be treated with a solution made by dissolving 2 lbs. of zinc sulphate in 1 gal. of water.

(5) **Metal Work**—Iron, steel and other metal work shall be cleaned thoroughly of all loose paint, dirt, oil, grease, rust, scale and other foreign matter before paint is applied.

The Paint and Its Application—(6) Designation of Paint to be Used—All woodwork, plaster, brick, stone, concrete and stucco which are to be painted, shall be painted with NATIONAL LEAD COMPANY'S Dutch Boy White-Lead, Dutch Boy Flating Oil, Dutch Boy Wall Primer, Dutch Boy Linseed Oil, pure turpentine and Dutch Boy Liquid Drier mixed according to the formulas hereinafter designated for each kind of work.

All metal shall be painted with NATIONAL LEAD COMPANY'S Dutch Boy Red-Lead-in-Oil, Dutch Boy Liquid Red-Lead or pure dry red-lead and Dutch Boy Linseed Oil mixed according to formulas hereinafter given for each specific purpose.

(7) **Tinting Materials**—In producing tints and shades, Dutch Boy Colors-in-Oil shall be used. If colors-in-oil are used in quantities large enough to affect the consistency of the paint, the quantities of thinners named in the formulas shall be increased in amount equal to one-half the weight of the tinting material.

(8) **Applying the Paint**—No exterior painting shall be done when rain or snow is falling, during fog, or until after dew or moisture which may be on the surface has completely disappeared. Painting done in winter weather shall only be done when the temperature is above 50° F. and when all surfaces are dry. All exterior work shall be allowed to dry at least 4 days before the next coat is applied and at least 2 days shall be allowed between coats on interior work.

Formulas

All the white-lead formulas that follow are based on Dutch Boy All-Purpose Soft Paste White-Lead. If heavy paste white-lead is to be used, the same formulas apply except for slight changes in turpentine or flating oil quantities as noted.

†Dutch Boy Liquid Drier..... 1 pt.

*With heavy paste white-lead, increase turpentine in priming and second coats to 1 1/2 gals., add 1 qt. turpentine or third coat gloss formula, and increase flating oil in flat finish formula to 2 gals.

†When boiled oil is used, reduce drier to 1/2 pt. **Boiled oil is preferable here. If it is not available, use raw linseed oil and add 1 1/2 pts. drier.

also publish a booklet, "Structural Metal Painting," which discusses the causes of corrosion and remedies for it, besides giving formulas and going into detail on the subject of painting structural metal of all kinds. For copies, simply address our nearest branch.

General Painting Specifications

Following are general specifications for the painting of interior and exterior surfaces:

Preparation of Surface—(1) Woodwork—New woodwork shall be cut smooth with sandpaper where required and dusted

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(9) New Woodwork, Exterior—Three coats of paint, mixed as follows, shall be applied:

	Priming Coat	Second Coat	Third Coat
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.	100 lbs.
Dutch Boy Linseed Oil	4 gals.	1½ gals.	3 gals.
*Pure Turpentine	1½ gals.	1½ gals.	1 pt.
†Dutch Boy Liquid Drier	1 pt.	1 pt.	1 pt.

*With heavy paste white-lead, add 1 qt. turpentine in third coat formula, and increase by this quantity the turpentine in other two coats.

†When boiled oil is used, reduce drier to ½ pt.

(10) Repainting Woodwork, Exterior—Two coats of paint, mixed as follows, shall be applied:

	First Coat	Second Coat
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.
Dutch Boy Linseed Oil	2 gals.	3 gals.
*Pure Turpentine	1½ gals.	1 pt.
†Dutch Boy Liquid Drier	1 pt.	1 pt.

*With heavy paste white-lead, add 1 qt. turpentine to second coat formula and increase by this quantity the turpentine in first coat.

†When boiled oil is used, reduce drier to ½ pt.

(11) Plaster, Interior—Plaster never before painted shall first receive a priming coat of Dutch Boy Wall Primer and then two coats mixed as follows:

	Second Coat	Third Coat	Third Coat
	Flat Finish	Flat Finish	Eggshell Finish
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.	100 lbs.
*Dutch Boy Flattening Oil	1½ gals.	1½ gals.	1½ gals.
Dutch Boy Wall Primer	2 gals.	2 gals.	8 gals.
†Dutch Boy Liquid Drier	1 pt.	1 pt.	1 pt.

*With heavy paste white-lead, increase flaking oil to 2 gals. in each case.

In repainting plaster, only two coats are necessary and the priming coat may be omitted.

(12) New Woodwork, Interior—Woodwork inside never before painted shall first receive a priming coat as follows:

	Priming Coat
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.
Dutch Boy Linseed Oil	3 gals.
*Dutch Boy Flattening Oil	2½ gals.
Dutch Boy Liquid Drier	1 pt.

*With heavy paste white-lead, increase to 3 gals.

This priming coat shall be followed by two coats mixed as follows:

	Second Coat	Third Coat	Third Coat
	Flat Finish	Flat Finish	Eggshell Finish
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.	100 lbs.
*Dutch Boy Flattening Oil	1½ gals.	1½ gals.	1½ gals.
Dutch Boy Wall Primer	2 gals.	2 gals.	8 gals.
†Dutch Boy Liquid Drier	1 pt.	1 pt.	1 pt.

*With heavy paste white-lead, increase to 2 gals. in each case.

(13) Repainting Woodwork, Interior—In repainting interior woodwork, only two coats are necessary. Use the same formulas as for New Woodwork, Inside, simply omitting the priming coat.

(14) Brick, Stucco, Concrete, Stone—Three coats of paint, mixed as follows, shall be applied to brick, stucco, concrete and stone never before painted.

	Priming Coat	Second Coat
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.
Dutch Boy Linseed Oil	3 gals.	2 gals.
Spar Varnish	2 gals.	1½ gals.
*Pure Turpentine	1½ gals.	1 pt.
†Dutch Boy Liquid Drier	1 pt.	1 pt.

	Third Coat	Third Coat
	Gloss Finish	Flat Finish
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.
Dutch Boy Linseed Oil	3 gals.	3 gals.
Dutch Boy Flattening Oil	1½ gals.	1½ gals.
*Pure Turpentine	1 pt.	1 pt.
†Dutch Boy Liquid Drier	1 pt.	1 pt.

*With heavy paste white-lead, increase turpentine in priming and second coats to 1½ gals., add 1 qt. turpentine to third coat gloss formula, and increase flaking oil in flat finish formula to 2 gals.

†When boiled oil is used, reduce drier to ½ pt.

*Boiled oil is preferable here. If it is not available, use raw linseed oil and add 1½ pts. drier.

General Painting Specifications

Following are general specifications for the painting of interior and exterior surfaces:

Preparation of Surface—(1) Woodwork—New woodwork shall be cut smooth with sandpaper where required and dusted

(15) Metal Work, Exterior and Interior—Three coats of paint, mixed as follows, shall be applied to exterior and interior metal work:

	Second Coat
	(light brown)
Dutch Boy Paste Red-Lead	100 lbs.
*Dutch Boy Linseed Oil	2½ gals.
Dutch Boy Lampblack	2½ gals.
Pure Turpentine	1 pt.
Dutch Boy Liquid Drier	1 pt.

	or
Pure Dry Red-Lead	100 lbs.
*Dutch Boy Linseed Oil	3½ gals.
Dutch Boy Lampblack	1 pt.
Pure Turpentine	1 pt.
Dutch Boy Liquid Drier	1 pt.

	Third Coat
	(dark brown)
Dutch Boy Paste Red-Lead	100 lbs.
*Dutch Boy Linseed Oil	3½ gals.
Dutch Boy Lampblack	6 pts.
Pure Turpentine	1 pt.
Dutch Boy Liquid Drier	1 pt.

*If genuine boiled linseed oil is available, use one-third boiled and two-thirds raw oil, omitting drier.

If liquid red-lead is to be used, specify Dutch Boy Liquid Red-Lead No. 1 (natural red-lead color) for first coat, Dutch Boy Liquid Red-Lead No. 6 (light brown) for second coat and Dutch Boy Liquid Red-Lead No. 7 (dark brown) for third coat.

Where a dark color other than brown is desired for the finishing coat, one of the following formulas shall be used according to the color desired:

	Light Green	Dark Green
Dutch Boy Paste Red-Lead	100 lbs.	100 lbs.
*Dutch Boy Linseed Oil	5½ gals.	5 gals.
Dutch Boy Medium Chrome Yellow	1½ gals.	3 gals.
Dutch Boy Chinese or Prussian Blue	1½ gals.	5 pts.
Pure Turpentine	1 pt.	1 pt.
Dutch Boy Liquid Drier	1 pt.	1 pt.

*If genuine boiled linseed oil is available, use one-third boiled and two-thirds raw oil, omitting drier.

If liquid red-lead is to be used, specify Dutch Boy Liquid Red-Lead according to the finishing color desired, that is: No. 8—light green; No. 9—dark green; or No. 5—black.

Formulas for Other Work

If the type of painting work to be done is not covered here, we shall be glad to furnish the proper formulas for it if you will address a request to NATIONAL LEAD COMPANY, 111 Broadway, New York, N. Y.

Booklets on Painting

A practical book, of unusual value to those interested in the subjects of paint and painting, is our "Handbook on Painting." This book gives formulas and directions for exterior and interior work of all kinds. It covers, in complete detail, the painting of wood, plaster, brick, stone, concrete, stucco and metal. We also publish a booklet, "Structural Metal Painting," which discusses the causes of corrosion and remedies for it, besides giving formulas and going into detail on the subject of painting structural metal of all kinds. For copies, simply address our nearest branch.

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General Painting Specifications

Following are general specifications for the painting of interior and exterior surfaces:

Preparation of Surface—(1) **Woodwork**—New woodwork shall be cut smooth with sandpaper where required and dusted



clean before priming. From old woodwork which has been painted before, all loose paint, scale, dirt and dust shall be removed. Wash off with benzine or turpentine all parts where liquid paint remover has been used.

After the priming coat on new woodwork is applied, all knots and sappy streaks shall receive one coat of shellac varnish brushed out thin and all dents, cracks and other defects shall be filled with putty composed of white-lead and whiting.

(2) **Plaster**—Before applying any paint to plaster, either new or old, see that it is clean and smooth. Fill all cracks and holes with patching plaster. Where new plaster to be painted is not properly aged, it shall be treated before priming with a solution made by dissolving 2 lbs. of zinc sulphate in 1 gal. of water.

(3) **Brick and Stone**—New brickwork shall not be primed until dry. At least 2 or 3 days of dry weather shall precede painting. If any mortar has become loose or damaged, all such places shall be pointed with mortar before applying paint. After priming, correct small defects in the surface with putty.

(4) **Stucco and Concrete**—Stucco or concrete shall be allowed to stand and dry at least six months before paint is applied. If painted before this time, it shall be treated with a solution made by dissolving 2 lbs. of zinc sulphate in 1 gal. of water.

(5) **Metal Work**—Iron, steel and other metal work shall be cleared thoroughly of all loose paint, dirt, oil, grease, rust, scale and other foreign matter before paint is applied.

The Paint and Its Application—(6) **Designation of Paint to be Used**—All woodwork, plaster, brick, stone, concrete and stucco which are to be painted, shall be painted with NATIONAL LEAD COMPANY'S Dutch Boy White-Lead, Dutch Boy Flattening Oil, Dutch Boy Wall Primer, Dutch Boy Linseed Oil, pure turpentine and Dutch Boy Liquid Drier mixed according to the formulas hereinafter designated for each kind of work. All metal shall be painted with NATIONAL LEAD COMPANY'S Dutch Boy Red-Lead-in-Oil, Dutch Boy Liquid Red-Lead or pure dry red-lead and Dutch Boy Linseed Oil mixed according to formulas hereinafter given for each specific purpose.

(7) **Tinting Materials**—In producing tints and shades, Dutch Boy Colors-in-Oil shall be used. If colors-in-oil are used in quantities large enough to affect the consistency of the paint, the quantities of thinners named in the formulas shall be increased in amount equal to one-half the weight of the tinting material.

(8) **Applying the Paint**—No exterior painting shall be done when rain or snow is falling, during fog, or until after dew or moisture which may be on the surface has completely disappeared. Painting done in winter weather shall only be done when the temperature is above 50° F. and when all surfaces are dry. All exterior work shall be allowed to dry at least 4 days before the next coat is applied and at least 2 days shall be allowed between coats on interior work.

Formulas

All the white-lead formulas that follow are based on Dutch Boy All-Purpose Soft Paste White-Lead. If heavy paste white-lead is to be used, the same formulas apply except for slight changes in turpentine or flattening oil quantities as noted.

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(9) New Woodwork, Exterior—Three coats of paint, mixed as follows, shall be applied:

	Priming Coat	Second Coat	Third Coat
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.	100 lbs.
Dutch Boy Linseed Oil	4 gals.	1½ gals.	3 gals.
*Pure Turpentine	1½ gals.	1½ gals.	1½ gals.
†Dutch Boy Liquid Drier	1 pt.	1 pt.	1 pt.

*With heavy paste white-lead, add 1 qt. turpentine to third coat formula and increase by this quantity the turpentine in other two coats.
†When boiled oil is used, reduce drier to ½ pt.

(10) Repainting Woodwork, Exterior—Two coats of paint, mixed as follows, shall be applied:

	First Coat	Second Coat
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.
Dutch Boy Linseed Oil	2 gals.	3 gals.
*Pure Turpentine	1½ gals.	1½ gals.
†Dutch Boy Liquid Drier	1 pt.	1 pt.

*With heavy paste white-lead, add 1 qt. turpentine to second coat formula and increase by this quantity the turpentine in first coat.
†When boiled oil is used, reduce drier to ½ pt.

(11) Plaster, Interior—Plaster never before painted shall first receive a priming coat of Dutch Boy Wall Primer and then two coats mixed as follows:

	Second Coat	Third Coat	Third Coat
	Flat Finish	Eggshell Finish	
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.	100 lbs.
Dutch Boy Flattening Oil	1½ gals.	1½ gals.	1½ gals.
Dutch Boy Wall Primer	2 gals.	2 gals.	2 gals.

*With heavy paste white-lead, increase flattening oil to 2 gals. in each case.
In repainting plaster, only two coats are necessary and the priming coat may be omitted.

(12) New Woodwork, Interior—Woodwork inside never before painted shall first receive a priming coat as follows:

	Priming Coat
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.
Dutch Boy Linseed Oil	3 gals.
Dutch Boy Flattening Oil	2½ gals.
†Dutch Boy Liquid Drier	1 pt.

*With heavy paste white-lead, increase to 3 gals.
This priming coat shall be followed by two coats mixed as follows:

	Second Coat	Third Coat	Third Coat
	Flat Finish	Eggshell Finish	
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.	100 lbs.
Dutch Boy Flattening Oil	1½ gals.	1½ gals.	1½ gals.
Dutch Boy Wall Primer	2 gals.	2 gals.	2 gals.

*With heavy paste white-lead, increase to 2 gals. in each case.
(13) Repainting Woodwork, Interior—In repainting interior woodwork, only two coats are necessary. Use the same formulas as for New Woodwork, Inside, simply omitting the priming coat.

(14) Brick, Stucco, Concrete, Stone—Three coats of paint, mixed as follows, shall be applied to brick, stucco, concrete and stone never before painted.

	Priming Coat	Second Coat
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.
Dutch Boy Linseed Oil	3 gals.	2 gals.
Spar Varnish	2 gals.	1½ gals.
*Pure Turpentine	1½ gals.	1 pt.
†Dutch Boy Liquid Drier	1 pt.	1 pt.

	Third Coat	Third Coat
	Gloss Finish	Flat Finish
Dutch Boy All-Purpose Soft Paste White-Lead	100 lbs.	100 lbs.
Dutch Boy Linseed Oil	3 gals.	1½ gals.
Dutch Boy Flattening Oil	1½ gals.	1½ gals.
*Pure Turpentine	1 pt.	1 pt.
†Dutch Boy Liquid Drier	1 pt.	1 pt.

*With heavy paste white-lead, increase turpentine in priming and second coats to 1½ gals., add 1 qt. turpentine to third coat gloss formula, and increase flattening oil in flat finish formula to 2 gals.
†When boiled oil is used, reduce drier to ½ pt.

*Boiled oil is preferable here. If it is not available, use raw linseed oil and add 1½ pts. drier.

(15) Metal Work, Exterior and Interior—Three coats of paint, mixed as follows, shall be applied to exterior and interior metal work:

	First Coat	Second Coat
		(light brown)
Dutch Boy Paste Red-Lead	180 lbs.	100 lbs.
*Dutch Boy Linseed Oil	2½ gals.	2½ gals.
Dutch Boy Lampblack	1 pt.	1 pt.
Pure Turpentine	1 pt.	1 pt.
Dutch Boy Liquid Drier	1 pt.	1 pt.

or

	First Coat	Second Coat
		(dark brown)
Pure Dry Red-Lead	100 lbs.	100 lbs.
*Dutch Boy Linseed Oil	3½ gals.	3½ gals.
Dutch Boy Lampblack	1 pt.	1 pt.
Pure Turpentine	1 pt.	1 pt.
Dutch Boy Liquid Drier	1 pt.	1 pt.

or

	Third Coat
	(dark brown)
Dutch Boy Paste Red-Lead	100 lbs.
*Dutch Boy Linseed Oil	3½ gals.
Dutch Boy Lampblack	6 pts.
Pure Turpentine	1 pt.
Dutch Boy Liquid Drier	1 pt.

or

	Third Coat
	(dark brown)
Pure Dry Red-Lead	100 lbs.
*Dutch Boy Linseed Oil	5 gals.
Dutch Boy Lampblack	6½ pts.
Pure Turpentine	1 pt.
Dutch Boy Liquid Drier	1 pt.

*If genuine boiled linseed oil is available, use one-third boiled and two-thirds raw oil, omitting drier.

If liquid red-lead is to be used, specify Dutch Boy Liquid Red-Lead No. 1 (natural red-lead color) for first coat, Dutch Boy Liquid Red-Lead No. 5 (light brown) for second coat and Dutch Boy Liquid Red-Lead No. 7 (dark brown) for third coat.

Where a dark color other than brown is desired for the finishing coat, one of the following formulas shall be used according to the color desired:

	Light Green	Dark Green
Dutch Boy Paste Red-Lead	100 lbs.	100 lbs.
*Dutch Boy Linseed Oil	5½ gals.	4 gals.
Dutch Boy Medium Chrome Yellow	1½ gals.	5 pts.
Dutch Boy Chinese or Prussian Blue	1½ gals.	6 pts.
Pure Turpentine	1 pt.	1 pt.
Dutch Boy Liquid Drier	1 pt.	1 pt.

	Black
Dutch Boy Paste Red-Lead	100 lbs.
*Dutch Boy Linseed Oil	14 gals.
Dutch Boy Chinese or Prussian Blue	1½ gals.
Dutch Boy Lampblack	6½ gals.
Pure Turpentine	½ gal.
Dutch Boy Liquid Drier	½ gal.

*If genuine boiled linseed oil is available, use one-third boiled and two-thirds raw oil, omitting drier.

If liquid red-lead is to be used, specify Dutch Boy Liquid Red-Lead according to the finishing color desired, that is: No. 3—light green; No. 9—dark green; or No. 5—black.

Formulas for Other Work

If the type of painting work to be done is not covered here, we shall be glad to furnish the proper formulas for it if you will address a request to NATIONAL LEAD COMPANY, 111 Broadway, New York, N. Y.

Booklets on Painting

A practical book, of unusual value to those interested in the subjects of paint and painting, is our "Handbook on Painting." This book gives formulas and directions for exterior and interior work of all kinds. It covers, in complete detail, the painting of wood, plaster, brick, stone, concrete, stucco and metal. We also publish a booklet, "Structural Metal Painting," which discusses the causes of corrosion and remedies for it, besides giving formulas and going into detail on the subject of painting structural metal of all kinds. For copies, simply address our nearest branch.