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.

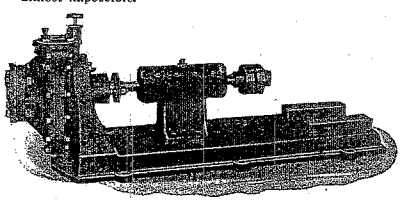
SERVICE

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.

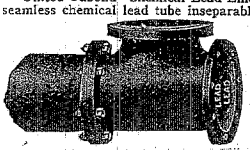


"UNITED" HARD LEAD CENTRIFUGAL ACID PUMP

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

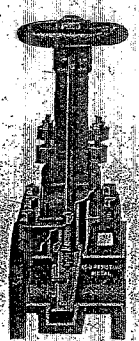
"United Tubond" Chemical Lead Lined Pipe is lined with a seamless chemical lead tube inseparably bonded to the outer casing. This "United" Method gives an absolutely uniform lining and a smooth interior surface with friction reduced to a minimum; also a lining free from porous or defective spots.



"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.

"UNITED" HARD LEAD OR TIN LINED ACID VALVES



"UNITED" CHEMICAL HARD LEAD LINED WEDGE TYPE FLANGED ACID GATE 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.

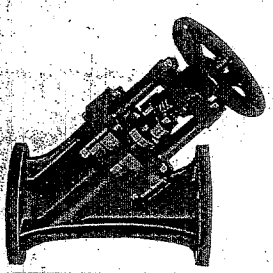
"United" Acid Valves are always tight when closed, and by seating at the top when opened, pressure is taken from the stuffing box.

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.



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

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.

Continued on Next Page

NATIONAL LEAD COMPANY

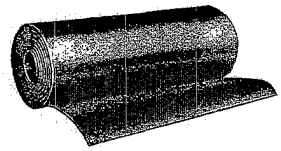
Sheet Lead and Lead Pipe

NEW YORK, 111 BROADWAY
BALTIMORE, 214 W. HENRIETTA ST.
BUFFALO, 116 OAK ST.
CHICAGO, 900 WEST 18th ST.
CINCINNATI, 659 FREEMAN AVE.
CLEVELAND, 820 W. SUPERIOR AVE.
ST. LOUIS, 722 CHESTNUT ST.
NATIONAL-BOSTON LEAD CO., 800 ALBANY ST., BOSTON
GEORGIA LEAD WORKS, EAST & BISHOPS STS., ATLANTA
GIBSON & PRICE, SWETLAND BUILDING, CLEVELAND
NATIONAL LEAD & OIL CO. OF PA., 316 FOURTH AVE., PITTSBURGH
JOHN T. LEWIS & BROS. CO., WIDENER BUILDING, PHILADELPHIA

PRODUCTS

Antimonial Sheet Lead
Chemical Sheet Lead
Crawlproof (Reinforced) Sheet Lead
Antimonial Lead Pipe
Chemical Lead Pipe

Other products of National Lead Company include: solder, babbitt metal, burning lead, traps and bends, ingot lead, block tin pipe, tin-lined lead pipe, lead wool, lead wire, lead washers, expansion bolts, red-lead, white-lead, litharge, linseed oil, flatting oil.



SHEET LEAD

Sheet lead of our manufacture is in use in many plants throughout the country and may be depended upon to render satisfactory service in withstanding the action of ammonia gas, phosphoric acid, sulphuric acid, electrolytic solutions, etc. As noted above, we are in a position to supply three kinds of sheet lead—antimonial, chemical and crawlproof or reinforced. Which particular type will best meet requirements in a given case can be determined only when all conditions surrounding the proposed installation are known. In this connection, the advice of our technical staff is always available. Simply get in touch with our nearest office.

ANTIMONIAL SHEET

Antimonial sheet lead is lead alloyed with various percentages of antimony to impart hardness and other desired properties. It possesses a high degree of acid resistance and under certain conditions has advantages over chemical sheet because of greater rigidity and strength. Its elastic limit is five times that of chemical lead, its tensile strength double, and it also has a lower specific gravity.

We can supply antimonial sheet in any gauge or thickness desired down to $\frac{1}{64}$" and can furnish sheets, in some weights, as large as 8′ wide by 25′ long.

CHEMICAL SHEET

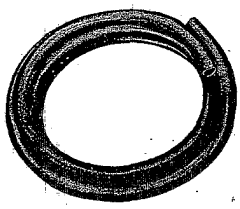
Our chemical sheet lead is made from the best grades of Missouri chemical lead, which insures a product of the proper composition to give the maximum in acid-resisting qualities. Uniform in thickness and free from irregularities, it is furnished in any gauge from $\frac{1}{64}$" up and in some weights in sheets as large as 12′ x 40′.

CRAWLPROOF SHEET

This is the newest development in sheet lead—a chemical lead sheet reinforced inside with antimonial lead supporting bars.

Crawlproof sheet is designed especially to prevent buckling, stretching and wrinkling.

Supplied in any thickness from $\frac{1}{32}$" up and in any size sheet not exceeding 8′ in width by 25′ in length.



LEAD PIPE

We make both antimonial lead pipe and chemical lead pipe. Only high quality materials are used and our pipe will be found to be of proper wall thickness, thus insuring correct weight per foot.

Antimonial lead pipe, as well as chemical lead pipe, is supplied by us in sizes up to 12" inside diameter and in various wall thicknesses. Catalog listing pipe sizes furnished on request.

GENERAL

We are always glad to advise on sheet lead installations and to submit estimates based on blue prints or specifications.

In ordering sheet lead please state, in case plain rectangle sheets are desired, thickness or weight per foot, width and length. If irregular sheets are required, please send sketch giving dimensions or provide a sketch, including dimensions, of the tank to be lined.

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NATIONAL LEAD COMPANY

Atlantic Branch

Acid Recovery Department

111 BROADWAY, NEW YORK, N. Y.

PRODUCTS

Concentrating Plants for
Sludge Acid
Spent Acid
Chamber Acid
Separating Plants for
Sludge Acid
Evaporators for
Weak Solutions of Sulphuric and Phosphoric Acid

PROCESS

The Simonson-Mantius Vacuum Process, patented in the United States and foreign countries, has been adopted by a large number of oil refineries for the concentration of separated sludge acid, by chemical plants for the recovery of spent acids, and by chamber acid plants for the concentration of weak chamber acid.

The salient feature of this process is that the work is carried on under high vacuum with indirect application of heat. The use of vacuum has very decided advantages, as it eliminates all fumes and leakage, materially decreases acid losses and reduces fuel consumption by lowering the boiling point of the acid and radiation losses.

By this process sulphuric acid can be concentrated to 66° Be. in a SUPER VACUUM Concentrator using a steam pressure of from 100 to 150 lbs. and a vacuum of 29.7". The application of such high vacuum practically eliminates all losses due to foaming. The concentration to a lower strength of 61 or 62° Be. does not require the installation of a special vacuum booster, and the work can be accomplished with a steam pressure of 45 lbs.

Concentrators can be equipped with our electric level indicator which insures perfect control of operation at all times.

APPLICATION OF PROCESS

Oil Refineries—The weak acid coming from the separators at a density of from 25 to 45° Be. is concentrated by our process to 56°, 61° or 66° Be. Where necessary the partially concentrated acid of 56° Be. is allowed to settle so as to remove tarry matter which has been separated by the decomposition of sulphonic acids, and then further concentrated to 66° Be.

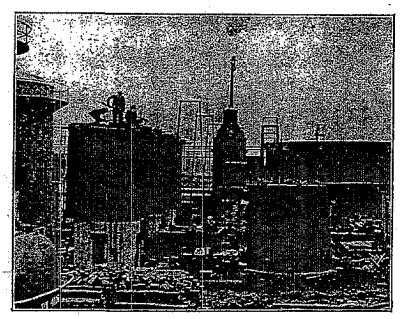
The 61° Be. acid can be used without further concentration for the treating of light oils and pressure distillates, or it can be reinforced with oleum to an acid of higher density and then used for treating kerosenes and lubricating oils.

In refineries requiring 98% acid for the treatment of their oils, the 61° acid is used for the absorption of SO_3 produced in a contact plant.

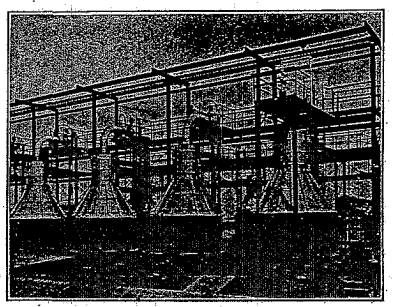
Under normal conditions the total cost of concentrating from 30 to 66° Be. will vary from $3 to $6 per ton of finished acid, and the concentration to 61° Be. only will cost from $1.50 to $3 per ton.

Operating costs depend on the size of the plant and the figures given are exclusive of overhead and depreciation.

Chemical Plants—Many chemical factories use large quantities of sulphuric acid in the manufacture of their products, and this acid can be recovered and concentrated economically by the Simonson-Mantius Vacuum Process to any desired density up to 66° Be.



SEPARATING AND CONCENTRATING PLANT



CONCENTRATOR AT EXTREME RIGHT IS A TYPE E SUPER VACUUM; OTHERS ARE REGULAR TYPE E CONCENTRATORS

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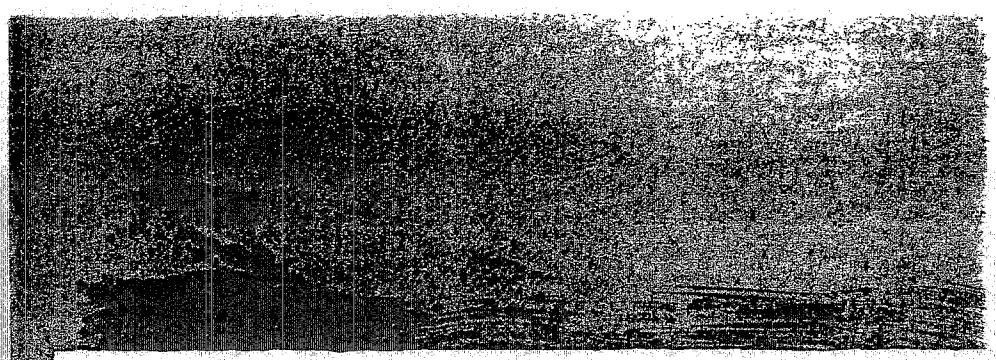

THE NATIONAL PIPE BENDING COMPANY

Incorporated 1883

101 RIVER STREET, NEW HAVEN, CONN.

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BRANCH OFFICES

Boston, Mass.
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Baltimore, Md.
Atlanta, Ga.
Cleveland, Ohio
Cincinnati, Ohio
Memphis, Tenn.
Chicago, Ill.
Duluth, Minn.
Denver, Colo.
Minneapolis, Minn.
Butte, Mont.
Los Angeles, Calif.

Canadian Representative: Albert G. Hill, Toronto, Ont.

PRODUCTS

Instantaneous Water Heaters (Bulletin No. 55).
Process Water Storage Heaters (Bulletin No. 65).
Feed Water Heaters (Bulletins Nos. 51A and 53).
Coils, Pipe and Tube (Bulletin No. 60).
Welded Headers (Bulletin No. 60).
Caustic Liquor Heaters (Designed to suit service).
Fuel Oil Heaters (Designed to suit service).
Preheaters.

SERVICE AND COOPERATION

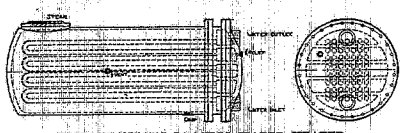
Detail information, estimates on drawings and specifications for any piece of apparatus will be gladly furnished to those who are considering the above equipment.

General information on Heaters and Coils can be obtained by writing for our condensed bulletins. They give weights and physical properties of our products and contain much valuable engineering data.

NATIONAL HOT WATER HEATERS

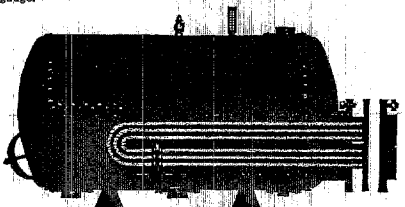
We make hot water heating units of two types, instantaneous and storage. Both types have their advantages and the installation depends upon the hot water demand. For either exhaust or live steam.

Instantaneous Type—Heats water as it flows either continuous or intermittently. Built for steam pressures up to 75 lbs. per sq. in. U-bend copper tubes through which the water passes are fitted into a cast iron or steel shell through which the steam for heating is passed. Made in sizes from 210 to 12,000 gallons of hot water per hour at temperatures from 40° F. to 180° F.



INSTANTANEOUS PROCESS WATER HEATER
One of Our Three Styles of Tube Elements

Storage Type—A combination of a closed pressure vessel and a steam tube heating element. For use under conditions where the instantaneous demand for hot water exceeds the immediate steam supply. A properly proportioned hot water storage heater will insure ample hot water without increased boiler capacity in many instances. Made in horizontal and vertical type to supply from 100 to 15,000 gallons of hot water per hour, heated through standard temperature range 50 to 180° F., with steam under pressure from 0 to 100 lb. gauge.

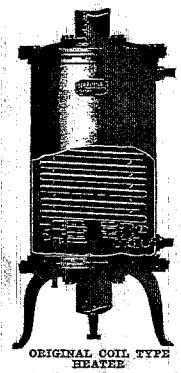


SINGLE ELEMENT STEEL SHELL HORIZONTAL STORAGE HEATER
Note the ease with which element can be removed
These heating elements can also be supplied separately for heating tanks, vats and flowing liquids in pipes.

FEED WATER HEATERS

National Feed Water Heaters are made up of a cast iron, wrought iron or steel shell containing one or more helical coils of seamless copper tubing. The water is pumped through the coils, absorbing heat from the exhaust steam in the shell.

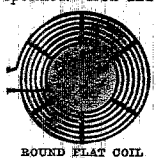
These heaters are made in sizes to provide for heating the feed water for a wide range of boiler sizes and invariably show large savings of fuel.



ORIGINAL COIL TYPE HEATER
Inside manifold. A type that has given efficient use for many years.

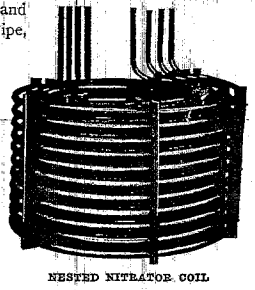
FACILITIES FOR COILS AND BENDS

All "National" Coils are continuous, without couplings or screwed fittings, unless specified. Iron and Steel Coils have electrically welded joints and all Brass and Copper Tubes have brazed joints. The National Pipe Bending Co. is prepared to submit designs, specifications and estimates covering coils and bends for the particular requirements of plant and will quote promptly on receipt of sketches and specifications. National fabricates any type of coil in **Nickel, Monel**, Chrome-Nickel, Chrome-Iron, Aluminum, Admiralty, Brass, Copper, Stainless Iron, Iron, Steel, and Wrought Iron Pipe, etc.



ROUND FLAT COIL

SPIRAL COIL



NESTED NITRATOR COIL

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.

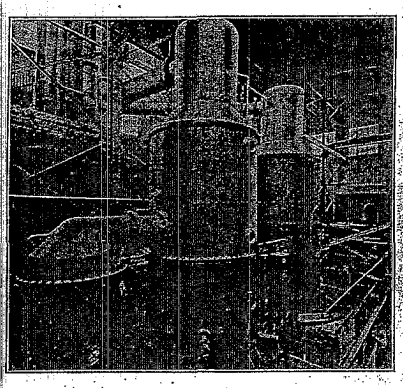
Under normal conditions the 56° acid can be concentrated to 66° Be. at a total cost of from $1 to $1.50 per ton of 66° acid.

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.

EVAPORATORS

We are building single and double effect evaporators for the recovery of dilute solutions of sulphuric and phosphoric acid; also for sulphuric acid solutions containing sodium, nickel, copper, or iron sulphate.



TYPES A AND D CONCENTRATORS

INSTALLATIONS

We have in operation or under construction the following plants:

	Units
Sludge Acid Concentrators	
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
Spent Acid Concentrators	
Carbide & Carbon Chemicals Corp	2
Davison Chemical Co.	1
E. I. DuPont de Nemours Co	11
Grasselli Powder Company	1
Hercules Powder Company	1
Nichols Copper Company	1
Tubize Artificial Silk Co. of America	5
Westvaco Chlorine Products, Inc.	1
Chamber Acid Concentrator	
Hard Chemical Works	1
Sludge Acid Separating Plants	
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 2500 tons of finished acid and 900 barrels of sludge. Eleven of these installations are of the SUPER VACUUM type.

INQUIRIES

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.