

ever, spent acid should be practically neutralized with lime or other alkali 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.

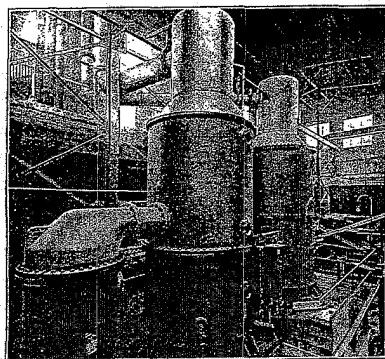
Under normal conditions the 56° acid can be concentrated to 66° Be. at a total cost of from \$1.70 to \$2 per ton of 66° acid.

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, copper, or iron sulphate.



TYPES A AND D CONCENTRATORS

following plants:

Sludge Acid Concentrators	Units
Bethlehem Steel Company.....	1
Empire Refineries	2
Gulf Refining Company.....	16
Houston Oil & Refining Co.....	1
Indian Refining Company.....	2
Lincoln Oil Refining Co.....	1
Marland Refining Company.....	3
Pure Oil Company.....	4
Roxana Petroleum Corp.....	2
Sharples Solvents Corp.....	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
E. I. DuPont de Nemours Co.....	8
Grasselli Powder Company.....	1
Tubize Artificial Silk Co. of America.....	5
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 1900 tons of finished acid and 900 barrels of sludge.

INQUIRIES

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

N 27768

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101 RIVER STREET, NEW HAVEN, CONN.

Boston, Mass.
New York, N. Y.
Philadelphia, Pa.

Baltimore, Md.
Charlotte, N. C.
Atlanta, Ga.

Baltimore, Md.
Memphis, Tenn.
Atlanta, Ga.

BRANCH OFFICES
Denver, Colo.
Pittsburgh, Pa.
Cleveland, Ohio

Minneapolis, Minn.
Butte, Mont.
Los Angeles, Calif.

Canadian Representatives: The Trane Company, Toronto, Ont.

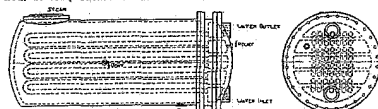
PRODUCTS

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

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.

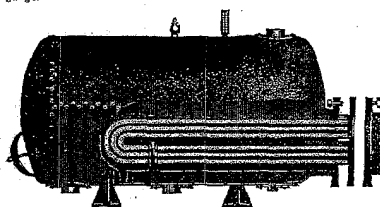


INSTANTANEOUS PROCESS WATER HEATER

One of Our Three Styles of Tube Elements

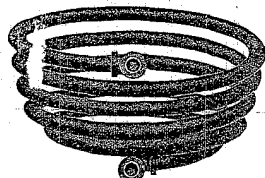
INSTANTANEOUS PROCESS WATER HEATER PUMP AND STORAGE TANK

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.

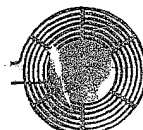


SINGLE ELEMENT STEEL SHELL HORIZONTAL STORAGE HEATER

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.



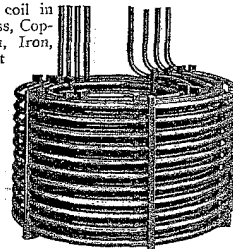
KETTLE COIL



ROUND FLAT COIL



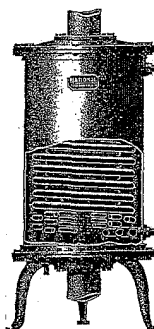
SPIRAL COIL



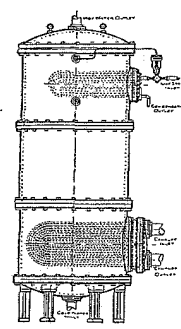
NESTED NITRATOR COIL

FEED WATER HEATERS

National Feed Water Heaters are made up of a cast iron, wrought iron or steel 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 FEED WATER HEATER
Inside manifold. A type that has given efficient use for many years.



VERTICAL STORAGE HEATER
Double Element

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, Brass, Copper, Stainless Iron, Iron, Steel, and Wrought Iron Pipe.

Process to any desired density and to 60 B. H. How
 1929

INSTALLATIONS

We ration or under construction the

Chemical Engineering Catalog - 1929
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., 180 ALBANY ST.

BOSTON

GEORGIA LEAD WORKS, EAST BISHOPS STS.

ATLANTA

GIBSON & PRICE, SWETLAND BUILDING, CLEVELAND

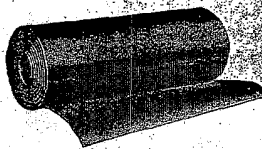
NATIONAL LEAD & OIL CO. OF PA., 316 FOURTH AVE., PITTSBURGH

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, flitting 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 $\frac{1}{16}$ " and can furnish sheets, in some weights, as large as 8' wide by 25' long.

CHEMICAL SHEET

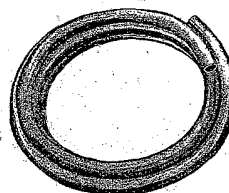
Our chemical sheet lead is made from the best grades of Missouri chemical lead, which insures a product of the proper composition to give the maximum in acid-resisting qualities. Uniform in thickness and free from irregularities, it is furnished in any gauge from $\frac{1}{8}$ " up and in some weights 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 $\frac{1}{16}$ " 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.

Continued on Next Page

Process to any desired density up to 66° Be. How-
ever, it is not recommended for use in contact with nitric

INSTALLATIONS

We can install lead pipe in any position or under construction the

Chemical Engineering Catalog - 1929

685

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.
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CLEVELAND, 820 W. SUPERIOR AVE.

ST. LOUIS, 722 CHESTNUT ST.

NATIONAL-BOSTON LEAD CO., 800 ALBANY ST. GIBSON & PRICE, SWETLAND BUILDING, CLEVELAND



Sheet Lead and Lead Pipe

ANTIMONIAL sheet lead, chemical sheet lead, crawlproof sheet lead—we can take care of your orders for these as well as for lead pipe in various sizes.

In addition, we manufacture lead-lined pipe, valves, fittings and tanks to meet the special requirements of the oil industry.

Full information about any of these products furnished on request.



NATIONAL LEAD COMPANY

New York, Baltimore, Buffalo, Chicago, Cincinnati, Cleveland, St. Louis, National-Boston Lead Co., Boston; Georgia Lead Co., Atlanta; Gibson & Price Co., Cleveland; National Lead & Oil Co. of Pa., Pittsburgh; John T. Lewis & Bros. Co., Philadelphia.

PET. REGISTER—JUNE

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