

LEAD INDUSTRIES ASSOCIATION

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NEW YORK 17, N. Y.

METALLIC LEAD PRODUCTS DIVISION

May 10, 1951

CHEMICAL BULLETIN NO. 43

SUBJECT: REPRINTS FROM
"CHEMICAL ENGINEERING"

To Members of the Metallic Lead Products Divisions

Attached are reprints from the "Corrosion Forum" section of CHEMICAL ENGINEERING (February, March and April, 1951 issues) discussing the performance of lead in contact with chromic acid, copper sulphate and citric acid.

These are part of a series of articles on materials of chemical construction covered, so far, in Chemical Bulletin Nos. 2, 9, 19, 20, 24, 25, 26, 31, 32, 37 and 40.

Very truly yours,

Robert L. Ziegler
Secretary



Materials of Construction vs. —

Chromic Acid

Lead

Kenneth H. Roll, Lead Industries Assoc., New York, N. Y.

Chromic acid is one of the major industrial chemicals with which lead is regularly used and preferred. Lead chromate which forms on contact with the acid has extremely low solubility and high adhesion.

In chromic acid plating, the largest chromic acid consuming industry, concentrations up to about 40 percent chromic acid are used at temperatures ranging up to 140 deg. F. Tellurium-antimony-lead anodes or antimony-lead anodes both containing up to 6 percent antimony are used successfully. Tin-lead anodes containing 7 percent tin are also used.

Tank linings and heating coils are made of antimonial lead. Chemical lead is not generally used here.

For prolonging the life of lead equipment to be used in contact with chromic acid, anodizing is recommended. Anodizing is simply an electrolytic method of forming an adequate protective coating by making the linings and coils periodically anodic.

A new high lead alloy has recently been placed on the market which was developed expressly for use with chromic acid. Longer service life without anodizing treatment is the chief advantage of the new alloy.

Copper Sulphate

Lead

Kenneth H. Roll, Lead Industries Association, New York, N. Y.

Lead is classified as a "Class A" material when used with copper sulphate according to the "Corrosion Resistant" test. That is, lead is recommended for use with copper sulphate at all temperatures and with all concentrations. Aqueous solutions of copper sulphate are acid but in contact with most metallic materials they do not behave as do solutions of equivalent acidity which contain sulphuric acid alone. In effect, copper sulphate in solution is an oxidizing salt and its presence with sulphuric acid accelerates the corrosion of most metals with the notable exception of lead. A protective insoluble film of lead salts forms on contact with copper sulphate and act to prevent any further corrosion. Lead is regularly used for anodes and tank linings in the electro-refining, electroplating and electro-forming of copper, all of which take place in copper sulphate solutions.

Citric Acid

LEAD

Kenneth H. Roll, Lead Industries Association, New York, N. Y.

Up to 150 deg. F. lead can be used with all concentrations of citric acid. However, where the acid is to be used for ultimate human consumption, the use of lead is not advised.

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