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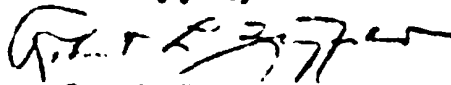
SUBJECT: MARKETS FOR LEAD
AND LEAD PRODUCTS
LEAD IN CERAMICS

To the Industry Development Committee of
the Lead Industries Association, Inc.

We are attaching the seventh in the series of memoranda presenting the LIA staff appraisal of various markets for lead and lead products.

Your comments will be welcome, as always, in the hope of approaching our budget discussions later this year most effectively and expeditiously.

Sincerely yours,


Executive Vice President

R12:1904



Look Ahead with Lead

MARKETS FOR LEAD AND LEAD PRODUCTSMEMORANDUM NO. 7LEAD IN CERAMICS

The attached chart shows the consumption of lead in ceramics from 1929 to date. Despite its wide and confusing fluctuations, it presents an encouraging picture in most respects with higher total and per capita consumption now than in the 1920s. We have been unable to locate figures prior to 1929 but, judging by other lead consumption figures, we believe that 1929 represents the largest or nearly the largest consumption in the 1920s. This was a little under 10,000 tons per year or about 0.16 lb. per capita. This was followed by a steep decline in the depression and a steeper increase at the beginning of the war, probably due to scarce and inventory buying. Following was a sharp decline, probably resulting both from the heavy earlier buying and war-time conditions and restrictions. There was another sharp increase at the beginning of the Korean war, followed by a sharp decline probably to work off inventories and then an all-time peak consumption of over 24,000 tons in the boom year 1955, followed by another decline.

The last few years show a moderate downward trend to just under 16,000 tons or 0.17 lb. per capita estimated in 1963, compared with just under 10,000 tons and 0.16 lb. per capita in 1929. However, in the last five years, sizable tonnages of lead oxide have been purchased by the ceramic industry from Mexico. To get the real consumption, these imports must be added to the foregoing figures. This is shown in the dotted line and is purely an estimate based on the increase in total imports of oxide from Mexico and the information that at least two of the largest frit manufacturers are buying their entire lead oxide requirements from that source. This estimate would bring 1963 consumption up to nearly 21,000 tons or 0.23 lb. per capita.

Another factor must be considered to put the picture in its true light. Imports of china from Japan and Europe have increased tremendously in the last few years. Because of lower costs abroad, some American china manufacturers are even having their own patterns made in other countries and are selling them here. Thus the lead content of ceramic products actually sold in the United States is still higher than the figures quoted above.

This all adds up to the fact that the ceramic market is a growing market for lead however one looks at it. Old products like whitewares have maintained their use of lead even after trying to get along without it during the war. The same is true of glass but the use of lead-bearing glasses, like electrical, radiation shielding, and solder glasses, is growing. Leaded porcelain enamel on aluminum is comparatively new and expanding. Electronic applications cover a wide range of products, like high dielectric glasses, glass bonded mica, piezoelectrics and others, all of which are relatively new. The use of lead glasses on structural clay products, like brick, tile and light-weight aggregates, is offering new

Markets for Lead and Lead Products

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and growing markets. In many instances, these new and expanding applications are comparatively small, perhaps 500 tons of lead a year at present, but because of the great variety of ceramic products in the aggregate they amount to interesting tonnages.

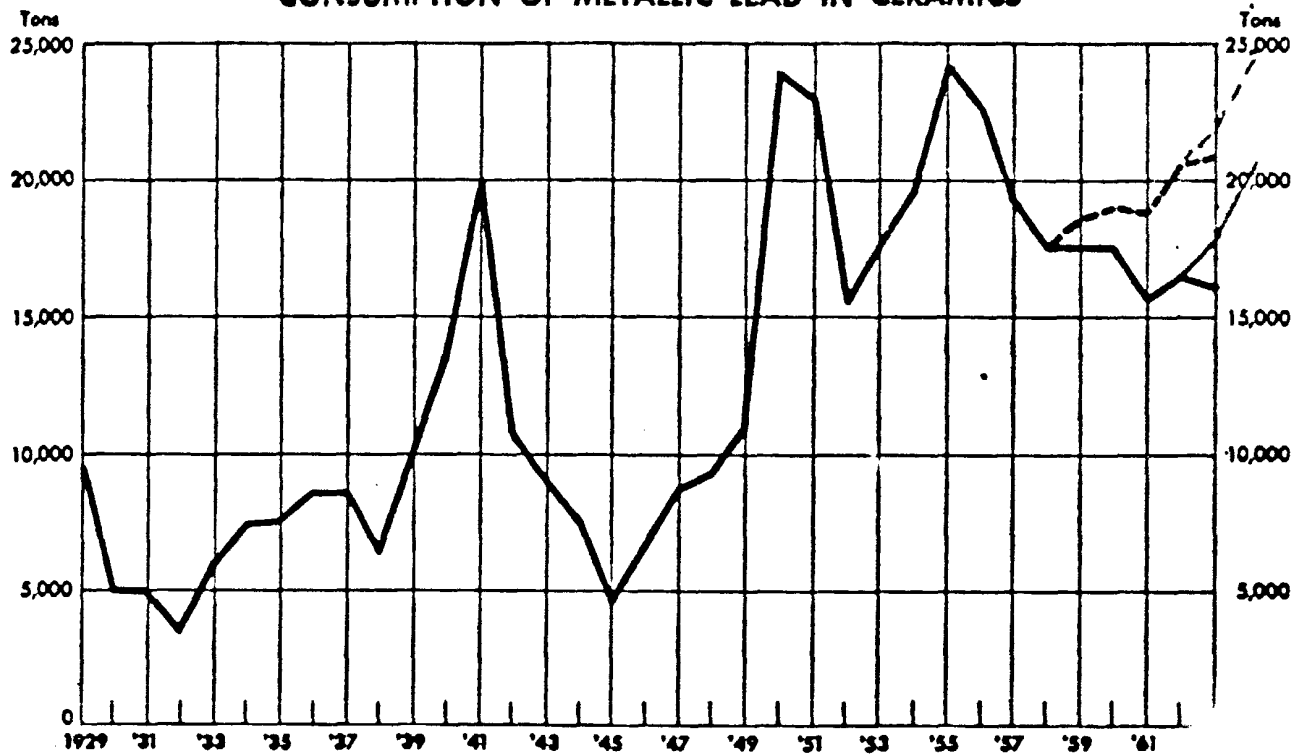
At least two new potentially sizable markets remain to be developed -- low firing ceramic bodies containing lead and low-firing leaded porcelain enamels for steel. Both of these objectives seem to have a reasonable possibility of attainment and would further swell the volume of lead used by the ceramic industries by substantial tonnages.

In 1955 L.I.A. recognized the possibilities of the ceramic industries for the consumption of more lead. A Ceramice Technical Committee was set up at that time and a loose-leaf manual "Lead in the Ceramic Industries" was prepared and published late in 1956. Since then seven supplements to the manual have been issued to keep it up to date. In 1957, an advertising campaign in the ceramic publications was started and later a small campaign on leaded ceramic finishes for metal in "Metal Products Manufacturing," both campaigns running to date. An extensive amount of field work has been done with companies in the ceramic industry and L.I.A. has been active at meetings associated with ceramics.

An extensive research fellowship program has accompanied this program with several objectives -- to get the results of research, to acquaint ceramic students with lead, to draw the attention of professors to the possibilities of lead, and to get publicity. We believe all of these objectives are being realized as many valuable technical papers have been published out of this research.

We believe that this entire program should be continued but perhaps somewhat modified by today's conditions and our experience with it. The market is one that has grown, even on a per capita basis, and should continue to grow but it will not necessarily do so without stimulation.

CONSUMPTION OF METALLIC LEAD IN CERAMICS



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