

LEAD INDUSTRIES ASSOCIATION, INC.

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NEW YORK, N. Y. 10017

TELEPHONE - AREA CODE 212

ON 9-6000

August 16, 1965

SUBJECT: MARKETS FOR LEAD AND LEAD PRODUCTS

CERAMICS
SOLDER

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

Attached are the third and fourth in the series of 1965 memoranda
to you presenting the LIA staff appraisal of various markets for lead and
lead products.

As always, we will welcome your comments in the hope of approaching
our budget discussions later this year most effectively and expeditiously.

Very truly yours,



Executive Vice President

RLZ:mk
Enc.



Look Ahead with Lead

August 16, 1965

MARKETS FOR LEAD AND LEAD PRODUCTSMEMORANDUM NO. 3-65LEAD IN CERAMICS

Since details of the use of lead in the various branches of the ceramic industries and our activities to develop those markets have been presented in Memorandum No. 7, Sept. 6, 1963 and in Memorandum No. 1-64, Sept. 15, 1964, this memorandum will only serve to bring you up to date in the fields in which we are currently active and to make suggestions for such future work as we deem advisable. A revised consumption chart incorporating final 1964 figures and estimated 1965 figures based on the first four months of the year is attached. The substantial growth which started to become evident several years ago appears to be continuing whether we refer to all the lead products of both domestic and foreign origin used in ceramics (as shown by the dotted line) or only the lead products of domestic manufacture (as shown by the solid line).

During the current year we continued our advertising to ceramists in general in the three national ceramic publications - BULLETIN OF THE AMERICAN CERAMIC SOCIETY, CERAMIC INDUSTRY and CERAMIC AGE - to keep the merits of lead products before them. However, we reduced the schedules in each from six to four pages. We also continued our two-page schedule on porcelain enamels for metal products in METAL PRODUCT MANUFACTURING. The new departure in the 1965 program was the use of four full-color pages on porcelain enameled aluminum for buildings in PROGRESSIVE ARCHITECTURE. This part of the program was prepared after a meeting with three leading porcelain enamellers of aluminum and representatives of the Porcelain Enamel Institute. The first ad did not appear until late May and brought 51 inquiries from architects in a matter of a few weeks.

To get maximum mileage out of the expensive color plates a four-page four-color brochure on architectural porcelain enameled aluminum is now planned for mailing to our list of architects, which will contain complete information about the product, specifications for architects to use, and pitfalls to avoid to get maximum satisfaction. It is hoped that porcelain enamellers can be persuaded to buy this brochure in quantity for their own distribution to prospects such as utilities have done with our storage battery brochures.

We believe that this part of our program, which promotes lead-bearing enamels for aluminum, should be continued with the cooperation of the enamellers. Incidentally, the Porcelain Enamel Institute has circulated reprints of our ads to members to keep them apprised of our activities.

We also believe that that part of our program directed to ceramists consisting of a minimal advertising schedule in trade papers and additional supplements to "Lead in the Ceramic Industries" should be continued without change.

There are, however, two new areas in the ceramic industries which we have been actively following up. Both involve electronic applications of lead. The first is lead ferrites in permanent magnets. Currently most ceramic permanent magnets are made of barium and iron oxides. To give

then satisfactory characteristics they are usually doped with around 4 percent lead oxide. It has been well proved through research that such magnets made of lead and iron oxides, which contain in the neighborhood of 20 percent lead, are far superior though somewhat more expensive. However, no ferrite manufacturers are equipped to make such a product and few would know how to do it even if properly equipped.

On the other hand, we have contacted a number of users of small electric motors which are potential customers, such as General Motors, Ford and Singer Manufacturing. All express a strong preference for the high-lead ferrites and estimates of potential consumption given us by G.M. indicate that they alone could initially use as much as 1,000 tons of lead a year in this product. However, the product is not now available to them even for development purposes and until it is, either commercially or on a pilot plant basis, the market cannot be exploited.

At present, there appear to be two ways of making high lead ferrites available. L.I.A. recently met with the manager of Clevite Corp.'s piezoelectric division which has been making lead zirconate-titanate for some years. They believe that with their experience they could produce lead ferrites and would be in an ideal position to sell them if a market is there because of their already established business in other products with potential users. We are doing all in our power to help them evaluate the market so that they will be willing to make the necessary investment in equipment to produce lead ferrites. We have put them in touch with many of the leads we have obtained as a result of our advertising and publicity on this subject. A favorable decision by Clevite would be ideal for L.I.A., which could then aggressively promote the use of lead ferrites knowing that the product was available.

In the event that Clevite does not want to go ahead with this, there is another possible approach. Perkite Corp. is another manufacturer of ordinary ferrites with whom we have discussed this problem because their technical director is one of the few men we know of competent to make the high lead ferrites. This company, however, is small, with limited capital, but with know-how. It is loath to risk too much of its own money to get into this business. They have indicated that some financial assistance from us in buying certain new equipment and getting into production could get them into it. We have asked for a definite detailed proposal along those lines to be in our hands before the preliminary Industry Development Committee meeting in late September.

Still a third possibility may develop. General Motors has indicated to us that they might go into the manufacture of lead ferrites themselves if no suitable suppliers are found and if we can help them find a man capable of developing this facility for them.

The second electronics market that bears watching is for lead zirconate-titanate piezoelectrics. This is now made by several manufacturers of which Clevite Corp. is the leader. They inform us that, although it has become well established in ultrasonics, the market has fallen somewhat short of what was expected largely because of cut-backs in military programs and applications. They have, however, more highly developed their spark pump so that, by the application of very little mechanical energy, a high intensity electrical spark is developed for ignition purposes. They inform us that in England this is being

widely used in place of open pilot lights on gas appliances such as kitchen ranges and water heaters. We have discussed the matter with the American Gas Association which has a patent on a kitchen range using spark pump ignition instead of pilot lights.

No recommendations are being made at this time but the matter will be investigated with Cleveite's British affiliates and others this fall.

August 16, 1965

MARKETS FOR LEAD AND LEAD PRODUCTSMEMORANDUM NO. 4-65SOLDER

This subject was previously covered in Memorandum No. 8, Sept. 16, 1963, and Memorandum No. 7-64, Oct. 6, 1964. A new consumption chart is attached showing the continued substantial growth of the use of lead in this product based on final figures for 1964 and estimates for 1965 based on actual figures for the first four months of the year. Per capita consumption of lead has risen from 0.61 lb. in 1909 to 0.74 in 1962 and 0.77 in 1964. These figures are from U. S. Bureau of Mines statistics and are not broken down further as to industries using solder. However, the almost sensational response to our solder advertising and promotional program started only a year and a half ago and resulting in more than 1,000 inquiries in the first six months of this year, has caused us to make a more detailed statistical analysis of the solder market for lead.

Since 1942 L.I.A. has gathered statistics on shipments of solder broken down into use in the automotive, canning, coating and miscellaneous industries, the latter including electrical applications. The L.I.A. figures are not quite as comprehensive as those of the U.S.B.M. but they nevertheless in general follow the same trend lines. The L.I.A. totals have therefore been plotted on the same chart with the U.S.B.M. to show them in proper perspective.

On a second chart the L.I.A. totals and breakdowns are plotted. The use of lead alloys for coatings is small, has generally declined since the war when they were often substituted for tin and other scarce-metal coatings, but has shown a slight upward trend in the last few years. This use may be disregarded here as our program onterne plate covers it.

Also in recent years the use of lead in solder for cans has generally declined but is still quite large and has increased substantially in the last two years. Two adverse factors have had an important influence on this use - substitution of cements and adhesives for solder in some kinds of cans and the advent of aluminum cans that do not use lead solder. Two favorable factors, however, are also having an influence and may help to continue the recent upward trend. Improved soldering methods have reduced soldering costs and improved joints, putting solder in a better competitive position, and improved methods in many instances have led to the practicability of using higher lead-content solders. It is worthy of note that the lead content of can solders is today some 10 percent or more higher than at the end of the war.

Consumption of lead in automotive solders has fluctuated considerably from year to year since the war but is at a fairly high level today, although it dropped substantially during years when compact cars were so popular. Also the lead content of automotive solders has increased several percentage points since the war. The two main uses are radiator and body solder. The latter probably accounts for most of the fluctuations, because in general the more expensive models use the most solders, and for the increased lead content. Body solder has had strong competition from certain plastics in repair work but in new car production nothing has yet proved

as satisfactory or adaptable to high speed mass production as solder. The major threat to radiator solder is the aluminum radiator, which does not employ lead solder, and which, if widely adopted could affect this market substantially.

The only other classification available statistically is a miscellaneous group which would include electrical applications, solder used in a variety of metal fabricating operations and wiping solder as perhaps the major sub-groups. The average lead content of these solders has remained relatively constant at around 70 to 71 percent. The total lead used in this group has increased since the war, although with fluctuations, and accounts for by far the largest tonnage. The great growth of the electronics industry is probably one important growth factor. Solderless joints offer a threat here and in the many miscellaneous applications other methods of joining using adhesives, welding, brazing and the like are strong competition.

At the beginning of 1964 L.I.A. started a campaign to promote the use of solder. It involves educating designers and users to the wide variety of jobs that solder can accomplish economically, the different solders and soldering methods that are available. The objective is to protect existing markets from competition and, since so much solder usage is concentrated in three industries, to develop new uses in other industries.

The program consists of a modest advertising campaign in design and metal fabricating magazines accompanied by technically helpful articles on solders and soldering methods. The interest in the program as gauged by inquiries has been sensational. Solder was also a feature of our exhibit at the Design Show and attracted considerable attention. Since this is a growing use of lead using around 7 percent of total consumption, we believe that this campaign should be continued and perhaps slightly expanded.