

LEAD INDUSTRIES ASSOCIATION

80 EAST 42ND STREET

NEW YORK 17, N. Y.

November 12, 1958

SUBJECT: LEAD INDUSTRIES ASSOCIATION
INDUSTRY DEVELOPMENT & RESEARCH FUNDS
RECAPITULATED BUDGETS FOR 1959

To the Industry Development Committee:

On pages 1 and 2 following will be found a recapitulation of the detailed budgets presented later in this report. The budgets approved for 1958 for both Industry Development and Research, together with estimated actual expenditures and budgets recommended for 1959 are presented.

The recommendations have been approved by the respective committees directing each of the specific programs and in the case of Research, by the Technical Steering Committee, prepared in cooperation with Dr. S. P. Kadtko, Director of Research. The new program for the promotion of industrial lead-acid storage batteries has been recommended by the Electric Storage Battery Company.

It will be noted that a few items formerly charged to the Ordinary Fund are now charged in part to the Industry Development Fund. These include part of the general overhead expenses, such as administrative salaries, rent and light and a few other miscellaneous items. It is felt that these charges should more properly be against the Industry Development Fund and the President of the Association has concurred in this recommendation.

Also, the budgets have been set up somewhat differently to show separately certain costs which had previously been distributed directly to various promotional funds. These include, for example, salaries and expenses of staff who work on more than one divisional activity and whose salaries and expenses have previously been distributed arbitrarily among the various funds, "Lead," and publicity. The new arrangement will simplify accounting procedures and, we believe, will be just as informative as methods previously used.

Respectfully submitted,

Robert L. Frazier
Secretary-Treasurer.



LEAD INDUSTRIES ASSOCIATION
INDUSTRY DEVELOPMENT AND RESEARCH FUNDS
RECOMMENDED BUDGET FOR 1969

TABLE OF CONTENTS

<u>SUBJECT</u>	<u>PAGE NUMBER</u>
Summary of Budget Recommendations	1-2
Metallic Lead Products	3-5
Pigments and Chemicals	6-7
Ceramics	8-9
Radiation Shielding	10
Industrial Storage Batteries	11
Miscellaneous	12
Research	13-14

Page 1
November 12, 1958

LEAD INDUSTRIES ASSOCIATION
INDUSTRY DEVELOPMENT AND RESEARCH FUNDS
SUMMARY OF BUDGET RECOMMENDATIONS

1959

	Approved Budget 1958	Estimated Expenditures 1958	Recommended Budget 1959
<u>INDUSTRY DEVELOPMENT</u>			
Direct Costs	\$109,300	\$105,070	\$155,900
Indirect Costs	73,500	70,000	116,100
General Overhead	-	-	31,000
Total Industry Development	\$182,800	\$175,100	\$305,000
<u>RESEARCH</u>			
Research Projects	\$130,000	\$68,400	\$220,000 ✓
Approved Projects not started before September 1st	-	-	61,600 ✓
Administrative Expenses, 1958	-	-	20,000
Administrative Expenses, 1959	-	-	38,000 ✓
Total Research	\$130,000	\$68,400	\$339,600

Industry Development Fund

Balance, January 1, 1958	\$17,504
Subscriptions, 1958	261,996*
	299,500
Less: Expenditures, 1958	243,400**
Estimated Balance, December 31, 1958	\$56,100

*Does not include \$28,000 authorized to be subscribed for research but not invoiced because not immediately needed.

**Includes \$68,400 for research.

Subscription rate for 1958 for industry development, including research, was 36¢ per ton of pig lead sold in the United States.

Based on estimated sales for 1958 of about 700,000 tons, the recommended budget for 1959 of \$305,000, if no reserves are used, would require a subscription rate of about 44¢ per ton but includes a suggested transfer of general overhead from the Ordinary Fund of \$33,000. Roughly 1¢ per ton subscribed will yield \$7,000.

Research Fund

The Technical Steering Committee's approved recommendations for 1959 were on the assumption that funds would be provided to complete projects started in 1958 but running into 1959 and also for projects approved for 1958 but not yet started. On the above basis the recommended budget for research for 1959, including L.I.A. reimbursement and all approved projects, would require subscriptions of about 26¢ per ton on approximately 1,300,000 tons of pig lead production in 1957. Since 1958 production was doubtless somewhat less than 1957 this figure will have to be revised upward. Roughly 1¢ per ton subscribed will yield \$13,000.

Page 2
November 12, 1958

LEAD INDUSTRIES ASSOCIATION

INDUSTRY DEVELOPMENT AND RESEARCH FUNDS

RECOMMENDED BUDGETS FOR 1959

	Approved Budget 1958	Estimated Expenditures 1958	Recommended Budget 1959
<u>INDUSTRY DEVELOPMENT</u>			
<u>Direct Costs:</u>			
Metallic Lead Products	\$33,000	\$37,050	\$66,500
Skidmore, Owings & Merrill Report	20,000	17,000	-
Pigments & Chemicals	30,500	26,500	35,900
Ceramics	25,300	24,220	27,500
Radiation Shielding	500	300	3,500
Industrial Batteries	-	-	22,500
Total Direct Costs	109,300	105,070	155,900
<u>Indirect Costs:</u>			
Design Engineering & Chemical Show			
Exhibits	5,000	5,000	10,000
General Advertising Space & Production	-	-	12,000
"Lead"	19,900	19,900	21,000
Publicity	6,000	6,000	8,500
Technical Service: Salaries, Travel, etc.	15,000	12,000	30,000
Salaries	17,600	16,630	23,100
Travel	10,000	10,500	12,500
Total Indirect Costs	73,500	70,030	116,100
<u>General Overhead:</u> (Formerly charged to Ordinary Fund)			
Salaries	-	-	25,000
Rent & Light	-	-	5,000
Miscellaneous	-	-	3,000
Total General Overhead	-	-	33,000
TOTAL INDUSTRY DEVELOPMENT	\$182,800	\$175,100	\$305,000
<u>RESEARCH</u>			
Cable Sheathing	\$12,000	\$12,000	\$18,000
Emissivity	10,000	7,400	10,000
Lead Alloys	20,000	10,000	20,000
Powder Metallurgy	-	-	15,000
Lead as a Cementing Material	12,000	12,000	-
Other Metallurgical Research	18,000*	-	20,000
Ceramics	27,000	27,000	30,000
Reinforced Lead	5,000*	-	20,000
Lead Chemicals	25,000*	-	30,000
Lead Foil	-	-	20,000
Contingencies	1,000**	-	17,000
Total	\$130,000	\$68,400	\$220,000
For Research approved but not yet started	-	-	61,600
Administrative Expenses, 1958	-	-	20,000
Administrative Expenses, 1959	-	-	38,000
TOTAL RESEARCH	\$130,000	\$68,400	\$339,600

* Not yet contracted for.

** Included additional \$12,000 used for cable sheathing research

Page 3
November 12, 1958

METALLIC LEAD PRODUCTS

The activities of this Division are under the general guidance of an Advisory Committee composed of representatives of Federated Metals Division of American Smelting and Refining Co., Bunker Hill Co., Gardiner Metal Co., Murdock Lead Products Co., National Lead Co., St. Joseph Lead Co., and United States Smelting Refining & Mining Co.

The architectural firm of Skidmore, Owings and Merrill was engaged to make a study of the use of lead in buildings and to recommend methods of expanding this usage. This report was received near the end of September, 1958. Meanwhile, the activities of this Division were conducted during the current year without major change.

Field work was continued with Homer S. Yetman contacting plumbers, city officials, builders and some architects in the interests of lead products. For the first time we had two four-page catalogs in Sweet's Catalogs for architects and light construction builders. One dealt with plumbing, the other with sheet metal work. We continued to publicize lead usage in "Lead" and in trade magazines, including chemical as well as building construction. Lead Construction Bulletin No. 2 was reprinted because of the heavy demand. We exhibited at the Home Builders Show, Plumbers' Show and National Chemical Exposition. We continued to sell our book, "Lead Work for Modern Plumbing" at cost to plumbers' apprentices. It is now an official text book of the union-sponsored training program. We supplied a judge of lead work for the international plumbers' apprentice contest and an instructor for the instructor training program held simultaneously. We presented a paper on lead chemical construction before the annual meeting of the National Association of Corrosion Engineers. The Solder Committee completed the manuscript for a Soldering Handbook now in process of being published by the American Welding Society. Considerable publicity has been obtained for lead both in building and chemical construction through talks before engineering and architectural groups, articles in trade papers and in "Lead," and wide circulation of reprints of articles prepared by us.

The following program is recommended for 1959 after giving due consideration to the Skidmore, Owings and Merrill study:

1. Sweet's Catalog - On specific recommendation of Skidmore, Owings and Merrill, we have renewed our catalogs in Sweet's for 1959 to be paid out of 1958 budget and believe that provision should be made in the 1959 budget for 1960. An extra color has been added, as recommended.
2. Construction Bulletin - Our series of "Lead Construction Bulletins," three of which have been issued to date, should be continued and expanded.
3. Flyers - Six bi-monthly one-page flyers describing specific building jobs using lead, with engineering details of the lead work, should be issued.
4. Handbook - A handbook of details for the installation of lead work should be published. Much of the ground work has already been done for such a book. This would be a non-recurring expense, at least for some years.
5. Advertising - Some of our advertising space in "Engineering News-Record" should be devoted to such engineering applications of lead as anti-vibration pads, lubricating bases for arches, and bearing plates for bridges.
6. Consultant - An architectural consultant should be retained to guide us in the type of material that would be helpful to architects and builders.

Metallic Lead Products

Page 4
November 12, 1958

7. "Lead" - This publication should continue to be distributed to architects. This is contrary to Skidmore, Owings & Merrill's recommendations but we feel that the cost is comparatively small and that we receive a sufficiently large number of inquiries from architects as a result of it to warrant the cost.

8. Exhibits - We should continue to exhibit at the Home Builders, Plumbers, and Chemical Shows, but the latter should not be charged to this budget because of the variety of products displayed.

9. Chemical Construction - This should continue to be publicized through technical papers, articles in the trade press and in "Lead," and wide circulation of reprints.

10. Field Work - Field work with plumbers, builders, architects and chemical engineers should be continued. The Advisory Committee wishes to call to the attention of the Industry Development Committee and Board of Directors that this field work is of such importance that consideration must soon be given to replacement of Mr. Yetman, who is due for retirement in three years, and that it would be advisable to have two field men during the last two years of Mr. Yetman's service to help break in a new man.

11. Text Book - Our supply of the text book, "Lead Work for Modern Plumbing," is depleted. As it is now an official text book for the national plumbing apprentice program it should be reprinted. To date 11,000 copies have been distributed and our entire original cost recovered. It is recommended that 5,000 additional copies be printed and sold at cost so that the cost will be recovered over the next four or five years.

12. Mailing Lists - For the direct mail advertising suggested our mailing lists should be materially expanded, based on lists of active architects and builders supplied us by Sweet's Catalog.

13. Research - Several research projects are recommended to the Research Director and Technical Steering Committee. These should include:

- a. Development of engineering data on lead asbestos anti-vibration pads.
- b. A basic study of lead alone and in combination with other materials for both vibration and sound attenuation.
- c. Development of thin lead laminations for inexpensive moisture proofing and corrosion protection.
- d. Development of lead coated plastic forms for prefabricated applications in buildings such as spandrels, gutters, gravel stops. The plastic would supply rigidity and the lead protect the plastic from weather.

BUDGET

A budget for the support of this program, exclusive of research, follows:

Metallic Lead Products

Page 5
November 12, 1958METALLIC LEAD PRODUCTS

	Approved Budget 1958	Estimated Expenditures 1958	Recommended Budget 1959
<u>Direct Costs:</u>			
Salaries & Social Security Taxes	\$7,500	\$7,700	\$8,000
Consulting Fees	-	150	2,000
Sweet's Catalog	6,000	8,000	8,000
Construction Bulletins	2,400	900	3,000
Flyers	-	-	3,000
Handbook	-	-	15,000*
Advertising	-	-	6,000
Reprints	1,000	500	1,000
Apprentice Contest	600	500	500
Conventions & Exhibits	7,000	10,000	6,000
Travel	5,500	6,000	5,500
Reprint-Plumbers' Text Book	-	-	4,500*
Mailing List Expansion	-	-	500
Miscellaneous	3,000	3,300	3,500
Total Direct Costs	33,000	37,050	66,500
*Non-recurring expenses			
<u>Indirect Costs:</u>			
Salaries	5,500	5,600	6,000
Publicity	2,000	2,000	3,000
"Lead"	3,500	3,500	3,500
Travel	3,000	3,500	3,500
Total Indirect Costs	14,000	14,600	16,000
Skidmore, Owings & Merrill Survey	20,000	17,000	-
TOTAL	\$67,000	\$68,650	\$82,500
Balance, January 1, 1958		\$12,204.15	
Transfer from Industry Development Fund		67,000.00**	
"Lead Work for Modern Plumbing" Receipts		450.00	
		79,654.15	
Less: Expenditures		68,650.00	
Estimated Balance, January 1, 1959		\$11,004.15	

** Included \$20,000 from Industry Development Fund for
Skidmore, Owings & Merrill Report

Page 6
November 12, 1958

PIGMENTS AND CHEMICALS

This program has been conducted under the guidance of the Red Lead Technical Committee on which the Bunker Hill Co., Eagle-Picher Co., Hammond Lead Products, Inc., National Lead Co., and Western Lead Products Co., are represented, with Dr. L. L. Carrick, until this summer, when he retired, professor of chemistry at the University of Michigan, as chairman and consultant.

In 1958 we added half-time to our staff, Mr. Owen F. Shobe, for many years technical paint representative of the Glidden Co., and a member of our Committee since its organization in 1943. Mr. Shobe has been making personal calls on highway engineers, government officials, railroads, oil companies and other large paint users in the interest of lead paints.

Our advertising schedule, which features red lead paints for highway structures, was increased from 6 pages in one color in "Engineering News-Record" in 1957 to 11 pages in two colors in the same magazine in 1958.

One new Red Lead Technical Letter, dealing with a formulation developed over a period of six years in our exposure testing program that proved superior for galvanized surfaces, was issued and mailed to our list of about 11,000 paint makers and users.

Our publicity both in "Lead" and in trade papers was stepped up.

A market survey of the ship building and maintenance industry was completed. It indicates a substantial market for anti-corrosive paints and that generally the ship owner determines the kind of paint to be used. It also indicates a need for considerable education of ship owners as a result of inaccurate conceptions they have about paint. This potential market is estimated at upwards of 5,000 tons per year based on the use of anti-corrosive paint on a typical ship and the total tonnage to be constructed and maintained. The latter market is by far the larger of the two.

Two new exposure testing programs were started during the year. One deals with a new wetting additive that could greatly increase the serviceability of red lead paints and the other a study of red lead paints vs. certain other formulations and proprietary paints.

A new test program to develop a single-coat paint with good tint retention for farm, highway and other machinery, based on lead silico-chromate, is also being planned. This is a field in which very little lead pigment is now used.

It should be noted here that red lead for paint was one of the few lead products to show an increase in 1957 over 1956, the tonnages being 15,993 and 14,331 respectively, an increase of nearly 12 per cent. Also, for the first seven months of 1958 red lead in paint declined only 4 per cent compared with an over-all decline in lead consumption of over 20 per cent.

The Red Lead Technical Committee recommends the following program for 1959:

1. Scope - Change the name of the Committee to Pigments Technical Committee and include in the scope of its work the use of white lead for top coats and the new lead-silico-chromate pigment (now produced by two members) for top coats and in combination with red lead for primers where lower cost is needed. It is not intended to try to displace red lead where it is giving satisfaction but to use the new pigment to help compete against other lower cost paints.

Pigments and Chemicals

Page 7
November 12, 1958

2. Advertising - Increase the present advertising schedule moderately by addition of some space in "Marine Engineering/Log" in the "American Road Builder," and in "Roads and Streets." This recommendation is intended to cover the marine market and to intensify coverage of the highway market which is constantly expanding.

3. Direct Mail - Issue three new Technical Letters on marine paints, farm and highway equipment paints, and a compilation of the best formulations from earlier Letter many of which are now out of print. Also, to issue a modest sales brochure on lead pigments for marine use.

4. Publicity - Continue to publicize lead paints as intensively as possible in "Lead" and in trade papers reaching paint users.

5. Exposure Testing - To initiate a new test program on one-coat finishes for farm, highway and other machinery and continue test programs now on exposure which have not been completed.

6. Personnel - Continue to retain Dr. Carrick as consultant and the half-time service of Mr. Shebe for field work.

BUDGET

Following is a budget to support the recommended program of the Red Lead Technical Committee for 1959 compared with the approved budget and estimated expenditures for 1958, broken down to show direct and indirect costs allocated to lead pigment promotion:

	Approved Budget 1958	Estimated Expenditures 1958	Recommended Budget 1959
<u>Direct Costs:</u>			
Consulting Fees	\$1,500	\$1,300	\$1,500
Salaries	5,400	5,400	5,400
Advertising Space & Production	14,800	14,800	20,000
Market Survey	900	900	-
Direct Mail	5,400	1,800	6,000
Test Programs	1,500	1,300	1,500
Miscellaneous & Contingencies	1,000	1,000	1,500
Total Direct Costs	\$30,500	\$26,500	\$35,900
<u>Indirect Costs:</u>			
Salaries	3,100	2,900	4,100
Travel	4,000	5,000	5,000
"Lead"	3,200	3,200	3,500
Publicity	2,000	2,000	2,500
Total Indirect Costs	\$12,300	\$13,100	\$15,100
Total Direct Costs	30,500	26,500	35,900
Total Expenditures	\$42,800	\$39,600	\$51,000
Balance, January 1, 1958		\$4,324.72	
Transfer from Industry Development Fund		42,800.00	
		47,124.72	
Less: Expenditures		39,600.00	
Estimated Balance, December 31, 1958		\$7,524.72	

Page 8
November 12, 1958

CERAMICS

This program has been conducted under the guidance of the Ceramics Technical Committee on which the Eagle-Fischer Co., Hammond Lead Products, Inc., National Lead Co., and Western Lead Products Co., are represented, with Dr. John M. Koenig, director, School of Ceramics, Rutgers University, serving as chairman and consultant to L.I.A.

In 1958 our advertising schedule was expanded somewhat to include 12 pages in "Ceramic Age," and 6 pages in "Ceramic News," in addition to 12 pages each in "Ceramic Industry," and "Bulletin" of the American Ceramic Society as in the previous year.

Two 4-page supplements to "Lead in the Ceramic Industries" were published and distributed, with a third in preparation which it is hoped to distribute before the year-end.

Twenty permanent educational exhibits were completed for donation to universities with accredited ceramic schools and 18 were distributed to the following schools: New York State College of Ceramics at Alfred, Ohio State University, University of Illinois, Pennsylvania State University, Georgia Institute of Technology, North Carolina State College, Virginia Polytechnic Institute, West Virginia University, University of Texas, University of Washington, University of California, (Berkeley), University of California, (Los Angeles), Iowa State College, Missouri School of Mines, University of Utah, Rutgers University, University of Toledo and Clemson Agriculture College.

The three graduate research fellowships on lead in ceramics established last year were renewed and six additional fellowships established. Fellowships supported by L.I.A. for the academic year 1958-1959 are as follows:

Rutgers - 2 fellowships - lead in electronic and other ceramic bodies

Illinois - 2 fellowships - lead in low-firing porcelain enamels

Ohio State - 1 fellowship - lead glasses for sanitary ware and clay sewer pipe

Penn State - 1 fellowship - phase diagrams involving lead oxide

Alfred - 1 fellowship - lead in glass

California (Berkeley) - 1 fellowship - lead ferroelectrics

Clemson - 1 fellowship - lead glasses for structural clay products such as brick.

Lead in ceramics received considerable publicity through our own quarterly "Lead," through releases to ceramic magazines, and through papers given at ceramic meetings at least some of which were the result of work done under one of our fellowships.

We were able to increase our field contacts with the ceramic industries both through attendance at more ceramic meetings and personal visits to companies engaged in the ceramic industries.

The Ceramics Technical Committee recommends the following program for 1959:

1. Advertising - Maintain the present schedule of 12 pages in "Ceramic Industry," "Bulletin" of the American Ceramic Society and "Ceramic Age," and 6 pages in "Ceramic News." Add 6 pages on lead in porcelain enamels in "Metal Product Manufacturing"

Ceramics

Page 9
November 12, 1958

and 6 pages on lead glasses for structural clay products in "Brick and Clay Record." Use four colors in some of the ads where color of the product is important.

2. Direct Mail - Issue additional supplements to "Lead in the Ceramic Industries" as suitable material becomes available. It is anticipated that two or three additional supplements should be issued in 1959.

3. Publicity - Continue to obtain as much publicity as possible through ceramic trade journals, papers at ceramic meetings, and "Lead."

4. Personnel - Continue to retain Dr. Koenig as consultant and committee chairman. Make as many staff contacts with the ceramic industry as possible.

5. Research - This is covered under the program for over-all industry research treated on page 13 of this report.

It should be noted that a patent was recently issued to one of the large frit manufacturers covering low-firing, lead-bearing porcelain enamels for steel, where not much lead is now used. This is indicative of the thinking in the enamelling industry and the future possibilities of lead. Also, while only a few hundred tons of lead are now being used annually on porcelain enamelled aluminum, a personal conversation with Alcoa indicates their confidence in the rapid expansion of this market.

BUDGET

Following is a budget to support the recommended program of the Ceramics Technical Committee in 1959 compared with the approved budget and estimated expenditures for 1958, broken down to show direct and indirect costs allocated to ceramic promotions:

	Approved Budget 1958	Estimated Expenditures 1958	Recommended Budget 1959
<u>Direct Costs:</u>			
Consulting Fees	\$1,500	\$1,500	\$2,000
Supplements to "Lead in Ceramic Industries"	5,000	5,000	4,000
College Exhibits	3,300	3,700	-
Research Fellowships	27,000	27,000	(a)
Advertising Space & Production	12,000	12,000	20,000
Miscellaneous & Contingencies	1,200	1,000	1,500
Deficit from Previous Year	2,300	1,020	-
Total Direct Costs	\$52,300	\$51,220	\$27,500
(a) Included in Research Budget			
<u>Indirect Costs:</u>			
Salaries & Social Security Taxes	5,500	4,630	6,000
Publicity	2,000	2,000	2,500
"Lead"	1,200	1,200	1,500
Travel	2,000	1,500	2,000
Total Indirect Costs	\$10,700	\$9,330	\$12,000
Total Direct Costs	\$52,300	\$51,220	\$27,500
Total Expenditures	\$63,000	\$60,550	\$39,500

Balance, January 1, 1958
Transfer from Industry Development Fund
Less: Expenditures
Estimated Balance, December 31, 1958

\$-1,020.61
63,000.00
61,979.39
60,550.00
\$1,429.39

Page 10
November 12, 1958

RADIATION SHIELDING

No reliable figures are available on the size of this market, yet there can be little doubt of its importance and future growth. The number of industrial and research laboratories using radioactive materials is growing rapidly and each employs from a few tons to 25 or more tons of lead shielding to say nothing of shipping containers for transport of radioactive materials which may run from a few pounds to 10 or more tons each. Ship reactors employ from 150 to 500 tons or more of lead each and the future appears to be definitely one of nuclear propulsion.

During the past year we have continued to gather information and engineering data on the use of lead for shielding and to give this use of lead publicity through "Lead" and other media. A second member of the staff was secret "Q" cleared this year. We are serving on an A.S.T.M. committee dealing with radiation shielding. We believe that sufficient reliable material is now available to us to warrant the publication of a series of bi-monthly leaflets dealing with engineering aspects of lead shielding for circulation to a mailing list of some 2,500 nuclear engineers which we have established. Otherwise, no major change in this program is recommended at this time.

Budget data follows:

	<u>BUDGET</u>		
	Approved Budget 1958	Estimated Expenditures 1958	Recommended Budget 1959
<u>Direct Costs:</u>			
Technical Bulletins	-	-	\$3,000
Miscellaneous	500	300	500
Total Direct Costs	\$500	\$300	\$3,500
<u>Indirect Costs:</u>			
Salaries	3,500	3,500	4,500
Travel	1,000	500	1,000
Total Indirect Costs	\$4,500	\$4,000	\$5,500
Total Direct Costs	500	300	3,500
Total Expenditures	\$5,000	\$4,300	\$9,000
Balance, January 1, 1958		\$921.74	
Transfer from Industry Development Fund		5,000.00	
		5,921.74	
Less: Expenditures		4,300.00	
Estimated Balance, December 31, 1958		\$1,621.74	

Page 11
November 12, 1958

INDUSTRIAL STORAGE BATTERIES

At the suggestion of the Electric Storage Battery Company we have been investigating with them the potential market for lead-acid storage batteries in industrial applications such as industrial trucks for materials handling, mine locomotives, stand-by, etc. In the industrial truck field the principal competition is with gasoline and propane powered trucks. Here the potential additional market for lead, exclusive of replacement, is estimated at a minimum of 17,000 tons of lead per year.

It is felt that a simple advertising, publicity and direct mail promotion program to support the advertising now being done by the battery companies and makers of electric trucks would be helpful in capturing this market. Also, the members of the Association should be prevailed upon to re-examine the possibilities of lead battery power in their own operations.

First, it is proposed to prepare a modest brochure with engineering and cost data for circulation to the management of L.I.A. members. Second, an advertising campaign consisting of 6 two-thirds-page ads each in "Business Week" and "Factory Management and Maintenance" is proposed. These media are selected to reach both top management and factory management since materials handling equipment is often a major capital expense and both groups may influence its purchase. The brochure would also be used to answer inquiries received from advertising. Three, case histories would be publicized in "Lead" and appropriate trade papers.

The details of this program would be worked out with the cooperation of Exide, other industrial battery manufacturers, and electric truck manufacturers. A recommended budget for 1959 follows:

	<u>BUDGET</u>	<u>Recommended 1959</u>
<u>Direct Costs:</u>		
Advertising Space & Production		\$19,500
Brochure		2,500
Miscellaneous		500
Total Direct Costs		\$22,500
<u>Indirect Costs:</u>		
Salaries		2,500
Publicity		500
"Lead"		500
Total Indirect Costs		\$3,500
Total Direct Costs		22,500
Total Costs		\$26,000

Page 12
November 12, 1958MISCELLANEOUS

To tie in with the stepped up research program and to disseminate as widely as possible technical information about lead which will encourage others to try lead in new products and do research on lead themselves, a new technical service man was added to the staff early in the year. Also approval was granted to exhibit at the 1959 Design Engineering Show and we have contracted for space. The Show will be in May of next year. Also, the tenor of "Lead" has been changed to place more emphasis on the many new applications of lead which our staff is turning up.

The following general program is recommended to encourage the use of lead in new products while at the same time providing technical service and promotion of existing products:

1. Direct Mail - Continue publication of "Lead" on a quarterly basis.
2. Exhibits - Continue to exhibit at the Design Engineering Show in 1960. Continue to exhibit at the Chemical Show in 1959 but no longer charge the cost to Metallic Lead Products because of the diversity of products exhibited.
3. Advertising - Initiate a campaign based on the properties and new uses of lead in "Materials for Design Engineering" and "Product Engineering." Six black and white pages in each are suggested.
4. Technical Service - Add one more technical service man to work in the field with users and potential users of lead and to help in preparation of more technical publicity material.

BUDGET

To support the foregoing recommendations the following budget is recommended:

	Approved Budget <u>1958</u>	Estimated Expenditures <u>1958</u>	Recommended Budget <u>1959</u>
"Lead"	\$12,000	\$12,000	\$12,000
Technical Service	15,000	12,000	30,000
Exhibits	5,000	5,000	10,000
Advertising Space and Production	—	—	<u>12,000</u>
Total	\$32,000	\$29,000	\$64,000

Page 13
November 12, 1958

RESEARCH

The Technical Steering Committee has approved the recommendations for research in 1959 contained herein. This has been done with the understanding that funds for projects already approved but not completed or started will be made available in addition to the new work proposed.

Cable Sheathing - An experimental continuous extrusion press was built by the John Robertson Co., at a cost of some \$80,000 to them. It was installed at their plant and began experimental operation in May, 1958. Since then we have supported the experimental program to produce lead-alloy cable sheathing continuously at a cost of \$1,500 per month until the end of 1958. Work is progressing satisfactorily, with arsenical alloys now being extruded with some degree of success. Anticipating that the program may not be fully completed by the year-end and that we may wish to test other alloys, it was felt wise to provide for continuing the work through 1959 on a provisional basis, with the Robertson Co. bearing about half the cost of the testing as they are to date.

Emissivity - This program at New York University really only got under full steam about September 1st. It was felt that since much of the work is quite basic and would reveal data requiring further study in more specific areas of application, provision should be made for its continuance for another year on the same financial basis.

Lead Alloys - This project at Armour Research Foundation was started about July 1st under a contract for one year. Inasmuch as the original proposal contemplated additional work on more complex alloys after the first year, it was felt desirable to provide for continuing the work for another year.

Powder Metallurgy - Recent work, particularly on aluminum has revealed the possibility of using lead powder as a means to fabrication of lead products with improved physical properties. It was felt that this possibility could not be overlooked and that provision should be made for some investigation in this field.

Lead as a Cementing Material - This project was started about July 1st under a six-month contract with Battelle Memorial Institute. Inasmuch as results to date have not been encouraging it is recommended that the project be terminated at the end of the project and no provision made for it in 1959.

Other Metallurgical Research - Proposals are under consideration from Battelle and other research organizations for work with age-hardening alloys and on other metallurgical aspects. It was also felt advisable to support one or two research fellowships at the University of Melbourne, which already has wide experience with lead metallurgy. Therefore, it is recommended that provision be made for additional work in this field when these projects have been fully evaluated.

Ceramics - Nine graduate research fellowships on lead in various phases of ceramics are being supported at seven different colleges during the 1958-1959 academic year. They average \$3,000 in value for a total of \$27,000. It is recommended that these be continued for the 1959-1960 academic year with provision for one new fellowship.

Research

Page 14
November 12, 1958

Reinforced Lead - As preliminary tests on fiber-glass reinforced lead were discouraging, a proposal from Armour was entertained on reinforcement of lead by felted fibers as developed by them and its acceptance is recommended. As only \$5,000 has been appropriated for this study and the Armour proposal was for \$25,000 for one year, the difference was added to the 1959 budget.

Lead Chemicals - A revised proposal for work in this field has been received from Arthur D. Little, Inc., for one year at \$36,000. Another proposal for one year at \$25,000 from research laboratories in Utrecht, Holland, which developed the organic tin compounds, is also under consideration. The latter is a basic study and the former emphasizes utilization studies of lead compounds. The subcommittee favors carrying forward both projects simultaneously in this important field.

Lead Foil - The Committee recommends work on lead foil and laminations with other materials for various applications such as water-proofing, corrosion protection and sound attenuation in cooperation with Broken Hill, who have already been working along some of these lines.

Contingencies - A contingency fund is recommended because of a number of possibilities for research that are being investigated by the Director of Research and others which may make prompt action desirable during the year with, of course, appropriate committee approval.

Administrative - The estimated administrative expenses for 1959 are to provide an assistant and another secretary and the necessary traveling expenses. Provision is also made for reimbursement of advances made by L.I.A. for administrative expenses in 1958, including the cost of securing a Director of Research through Booz, Allen and Hamilton.

No budget figures are appended here as they appear in detail in the introductory section of this report, page 1 and 2.