LEAD INDUSTRIES ASSOCIATION

60 EAST 42nd STREET

NEW YORK 17, N. Y.

June 12, 1959

SUBJECT: LEAD ANTIVIBRATION PADS

To the Industry Development Committee
of the Lead Industries Association

This memorandum is intended to give you some idea of the market for lead, in combination with either asbestos or other materials, for antivibration pads in building and machinery foundations, as well as the need for engineering data to be developed by the proposed research program. Any estimate of the market must, of course, be based on the assumption that the research will show lead to be economical and efficient and competitive with other materials now used. The subject naturally falls into two parts: (a) building foundations, (b) machinery foundations, which will be considered separately.

Building Foundations

Lead-asbestos pads have been specified by the New York Central Railroad for antivibration purposes in building foundations for more than 40 years. By far the greatest part of their use has been confined to the buildings along the railroad right of way under Park Avenue into Grand Central Terminal in New York City. Such buildings as the Graybar, New York Central Office Building, the Waldorf Astoria and, more recently, the Union Carbide Building, rest on these pads, and the foundations for these buildings each require some 40 or 50 tons of lead.

Grand Central Terminal itself does not rest on these pads, and the vibration is noticeable in the terminal as compared with these buildings. In fact, New York Central engineers have told us that vibration in the terminal has at times caused the breaking of plate glass windows and the rattling of glasses in the terminal restaurants.

Some other buildings which rest on these pads are the New York Central's Buffalo station, Pennsylvania Railroad's 30th Street station in Philadelphia, Canadian National Railways' terminal and the Queen Elizabeth Hotel in Montreal. The New York Central tracks passing through the Bell Telephone Laboratories on West Street also employ lead pads.

The Boston & Maine Railroad likewise bought some of these pads for use on a cantilever bridge.

Recently a two-story medical building at Queens Boulevard and Broadway in Elmhurst, Long Island, was erected on these pads, which required a little more than one ton of lead. This resulted from FHA requirements that specify these pads where vibration is a problem. Similarly, they were specified for

a multistory apartment building at Caton Avenue and McDonald, Brooklyn, and they are included in the specifications for the proposed motel to be erected over the New York Central freight tracks on Eleventh Avenue. They will also be used under three new office buildings along Park Avenue, including the new Grand Central Office Building. The New York City Transit Authority now has a specification for lead-asbestos pads for buildings tied in with subway structures.

In building construction these pads have doubtless proved their value, but they are specified by hit-or-miss methods since no engineering data are available. For example, loads on these pads under buildings range all the way from about 250 to 800 or 1000 pounds per square inch. Thus, when we publicize these pads, we are unable to reply with specific design data but can only tell the architects and engineers what has taken place. It is felt that with adequate engineering data and intensive publicity much wider use of these pads might be found in buildings adjacent to railroads in other cities and to subways or roads carrying heavy traffic. The lead-asbestos pad apparently has no competition for this use, but architects and engineers have to be convinced that the small additional expense is worth while and the additional expense is small in comparison with the total cost of the building.

The recent specification of these pads in spotty instances such as the medical building in Elmhurst and the apartment building in Brooklyn indicates a fairly substantial untouched market. Also, the large tonnage used in the foundations of any one major building indicates a worthwhile market even though the number of such buildings which might use the pads would be relatively few per year.

Machinery Foundations

We believe that the potential market for lead combination pads under machinery is considerably greater than that for the pads under buildings. The principal use of these pads to date has been under newspaper printing presses, which require about one ton of lead for each 12-unit press. William Ginsberg Associates, architects and engineers of New York City, inform us that they design about 25 per cent of all new newspaper printing plants in the United States. They have a standard specification for lead asbestos pads under the presses. Based on their use of lead, we estimate that newspaper printing presses could consume some 75 to 100 tons of lead per year. While this is not large, the potential market for similar use under other printing presses would be many times this amount.

Sheet lead or poured lead is used occasionally under such presses but there are no engineering data available to develop this market. We are unable to tell any interested people at what loads and what vibration frequencies the lead is most efficient, or even whether it will do the job.

Attached as Exhibit A is a partial list of users, including newspapers whose presses are now installed on lead-asbestos pads, which includes all of the Scripps-Howard, Knight and Newhouse paper chains. The Goss Printing Company and R. Hoe & Co., manufacturers of printing presses, have also bought lead pads occasionally directly from the manufacturer.

William Ginsberg Associates have told us that, if engineering data were available, these pads could be used under a great many other types of machinery and suggested air conditioning equipment as a great potential market. In this connection we have learned of only one installation, the cooling tower on the roof of the new building at 575 Lexington Avenue, New York. The architects, Weinberger, Frieman, Leichtman & Quinn, have informed us that the pads are performing satisfactorily. The pads for this cooling tower used approximately 100 pounds of lead.

We have discussed the matter with the Carrier Corporation and also the Air Conditioning and Refrigeration Institute of Washington, D. C. Carrier Corporation informs us that they are currently using rubber, cork and springs as antivibration measures under compressors, pumps and fans. According to the Air Conditioning Institute, the number of compressors sold for this purpose each year over the last five years has averaged well over three million, with a similar number of pumps and fans. Even if only 10 pounds of lead were used per unit in antivibration pads, this would offer a total potential market of better than 50,000 tons per year and, even if only a small fraction of this market were captured by lead, the tonnage could be substantial.

A Chicago construction company has asked us for assistance in connection with an existing compressor installed on springs which are not giving adequate performance. Without engineering data we have so far been able to be of little help. This same company felt they would be useful to isolate rooms containing business machinery.

We have studied the catalogs of manufacturers of competitive materials and devices such as the Felters Company of Boston; Clark, Cutler, McDermott Company of Franklyn, Massachusetts; Lord Manufacturing Company of Erie, Pennsylvania; and 3M Manufacturing Company of New Haven, Connecticut. Their products range from spring mounts through felt, rubber, Neoprene and vinyl chloride surrounding sisal fibers in cork. Uses suggested for Neoprene pads, for example, include grinders, shoe machinery, printing equipment, punch presses, fans, compressors, blowers, pumps, motors, heavy instruments, business machines, generators, conveyors, drill presses, wood finishing machinery, screw machines, gear cutters, riveting machines, ball and roll mills, sugar refining machinery, air conditioning equipment, instrument panels, addressographs, power sewing machines and die casting machines.

One catalog, for example, describes the use of felt pads under 2,000 looms in a single textile mill. We estimate that, if these pads had been lead-asbestos instead of felt, approximately eight tons of lead would have been employed in this single plant.

Some lead-asbestos pads were recently purchased by Vibration Mounting, Inc., a manufacturer of other types of antivibration devices. It is understood that these were to be used for launching pads for Nike missile bases. The U. S. Bureau of Standards is soon moving into extensive new quarters. The Director of the Bureau has told our Research Director of the great concern they have about vibration in connection with the tremendous amount of costly instruments and equipment in their laboratories. He further said that if engineering data on lead pads were available, they would be considered for uses which would amount to many tons of lead.

Apparently the competitive materials do not have the durability of lead-asbestos pads. Carrier Corporation informed us that they expect about 10 years' life out of the materials they are using and that they then have to be replaced. They showed sufficient interest in the lead-asbestos pads so that they are sending an engineer to visit us.

Conclusions

While the foregoing does not attempt to place a figure on the total market nor on the portion of the market which we might expect to capture, we believe that it does indicate a very substantial potential tonnage, of course providing that the research will develop information capable of helping us to sell the market.

Since publicizing the pads under the Union Carbide Building both in our magazine, LEAD, and in an ad in ENGINEERING NEWS-RECORD, we and the manufacturers of pads have received quite a number of inquiries asking for further engineering data and assistance in design, which we have been unable to supply with the information we have. Excerpts from some of these inquiries are attached for your information.

We feel that the recommendation of the Technical Steering Committee to develop the necessary technical data should be approved and will be worth the expenditure and would be the means of providing us with the necessary information to develop a technical publicity and promotional campaign to capture some of this market.

Very truly yours,

Secretary

Att. Exhibit A--List of Users
Exhibit B--Excerpts from Inquiries

EXHIBIT A

Partial List of Users of Lead-Asbestos Pads in Recent Years

Boston Herald Traveler

Vibration Mountings, Inc.
(various installations)

The Jersey Journal

Boston & Maine Railroad

The Chattanooga Times

Washington Post Herald

Union Carbide Building, New York, N.Y.

Raisler Corporation

The Knickerbocker News, Albany, N. Y.

Buffalo Evening News

The San Antonio Light, Texas

Texarkana Gazette & Daily News

Texarkana Construction Co.

Hartford Courant, Connecticut

The Scripps-Howard Supply Co.
(Scripps-Howard Newspaper Chain)

The Pittsburgh Press

Newark Evening News

Goss Printing Press Co., Chicago

Akron Beacon Journal, Akron, Ohio

Harrisburg Patriot News

The Detroit Free Press

Turner Construction Co.
Philadelphia Bulletin Job

Akron Beacon Journal

Jayburn Engineering Co.
Long Island Daily Press,
Jamaica, L. I., N. Y.
(Newhouse Chain)

Fort Worth Star Telegram

Newark Star Ledger

Winter-King & Son, Beaumont, Texas

The Austin Company
(Cleveland Job)

Chicago Daily News

Albany Times Union

The Spokesman Review, Spokane, Wash.

The Austin Company
Washington Daily News

Amdor Structures Co.
Queens Medical Center Bldg.,
Elmhurst, L. I., N. Y.

The Austin Company
Pittsburgh Press

Patriot News, Harrisburg, Pa.

Journal of Commerce, New York, N. Y.

Detroit Free Press

The Cleveland Press

Walter Scott & Co.

Greenville-News Piedmont
Greenville, N. C.

Clarion Ledger
Jackson, Miss.

Memphis Commercial Appeal

Niagara Falls Gazette

New York World Telegram

Albert Kahn Engineers
Washington Post

Miami Herald

Raleigh News & Observer

Sellars Construction Co., Montclair, N. J.

Wilkes Barre Publishing Co.

New Britain Herald

Lancaster Newspapers, Inc.

St. Petersburg Times

Beaumont Enterprise & Journal

The Houston Press

L. I. Star Journal

Portland Oregonian

Portland Journal

Miami Herald

Geo. Fuller and Co.

Dallas Morning News

James J. Waters Corp.

Struck Construction Co.

EXHIBIT B

Excerpts from Letters to Lead Industries Association

Re Lead Pads

June 10, 1959

We would very much appreciate learning more about the vibration insulation properties of lead, as described on Page 219 of the Product Engineering SHOW GUIDE for 1959.

R. L. Daily
Messer Cutting Machines, Inc.

No Date

I am a bridge design engineer with Michigan State Highway Department.

"If you are concerned with the problem of vibration suppression or sound attenuation--in architecture, in heavy machinery or press design, it will pay you to investigate the advantages of lead. Write us today, for complete and detailed information."

Please send me the above mentioned information.

Arthur Jones
Michigan State Highway Department

May 11, 1959

The following paragraph is taken from one of your magazine ads:

"If you are concerned with the problem of vibration suppression or sound attenuation--in architecture, in heavy machinery, or press design, it will pay you to investigate the advantages of lead. Write us today, for complete and detailed information."

Please send me information referenced in the above paragraph, as quickly as possible.

J. M. Risso, Project Engineer
Radio Corporation of America

May 6, 1959

Would you please send me any available information you may have on the design and installation of lead-asbestos anti-vibration pads. These pads are briefly described on p. 83, ENR, April 23rd, 1959.

A. P. Balodis, P.Eng., Design Section
Polymer Corporation Ltd., Canada

May 4, 1959

Your Ad in the Engineering News Record of April, 1959, with reference to "How Lead Solves Vibration Problems" is of interest to our office from the standpoint of constructing a base for large centrifugal refrigeration units for air conditioning and for large fans for air conditioning. I would appreciate any further information that you might give to us with reference to where this material can be purchased and any additional literature that you may have with reference to it.

Vincent D. Sill
Sill Construction Company

May 1, 1959

Kindly furnish any available literature on vibration suppression or sound attenuation and the use of lead in connection therewith.

M. M. Fialkow, Chief, Design Branch
U. S. Army Engineer District, N. Y.

July 25, 1958

Having read with great interest the article "New Union Carbide Building Floating on Lead" in your magazine "Lead", volume 22, Number 2, we would like to obtain from you, pamphlets which deal with engineering information on lead pads as anti-vibration material.

Egon Benesi, Sr. Research Engineer
Research Staff, General Motors Corp.

Excerpts from Recent Letters to Lead Pad Manufacturers

June 4, 1959

We are interested in the utilization of lead for sound and vibration attenuation in our machine tools, and have been referred to you by the AZI-LIA Expanded Research Program who suggests that you manufacture lead asbestos vibration pads which may be used for this type of sound deadening. We would like for you to please send samples of material for use in this type of work to the attention of our Mr. John Otrebski, Metallurgist. We thank you.

L. O. Huffman, Buyer
The Monarch Machine Tool Company

May 5, 1959

We are very much interested in learning if you have any material or process available which could be placed on the inside of some moving machinery to deaden the noise and vibrations, or do you know of any soundproof material which could be used for this purpose? Thank you for your courtesy.

Joseph Seiberlich, Research Associate
Professor, University of New Hampshire
Engineering Experiment Station

May 2, 1959

Request for bid on 10 1-1-1 Floating Base for Newspaper Mailing Machine

Dow, Jones & Company, Inc.

April 9, 1959

It has become necessary to isolate a 2000 square foot area of our present factory for purposes of a gage laboratory. The equipment in the room will consist in part of an interferometer which requires extreme minimum vibration.

If you manufacture any product which could be used to isolate the floor of the proposed laboratory, I would appreciate your sending to my attention such information as is available.

R. M. Mills, Jr., Plant Facilities Eng.
Ordnance Department of the Defense
Electronics Division, General Electric Co.

April 9, 1959

We have an urgent problem of eliminating noise and vibration from our heavy presses.

Any information on your product relative to the above would be greatly appreciated.

Steven Demchuk, Plant Manager
Ludington Sheet Metal Works

October 6, 1958

We are interested in the use of anti-vibration pads as a means to reduce sympathic vibration in tall chimneys. We contacted the Lead Industries Association, and they sent us their available literature and your name. We are primarily concerned with engineering data at this time and were wondering if you could furnish us with information pertaining to the maximum allowable compressive stress the pad can withstand.

Secondly, any information you could supply as to the consideration given to creep failure of the lead under compression would be helpful.

R. W. Snook
Custodis Construction Company, Inc.

October 3, 1958

We have been advised by Mr. David M. Boreing of the Lead Industries Association that you are in the process of manufacturing an anti-vibration lead pad which would be helpful in reducing sounds set up by vibration from grinding machinery which is used in our steel concrete reinforced plant here.

It is our understanding that this work is still in the experimental stage and even though you may not be ready to offer any product at this time we would appreciate any helpful information which you might be able to give us leading to the successful solution to our problem.

Horace S. Felton, President
Felton, Sibley & Co., Inc.

August 4, 1958

We are interested in the use of anti-vibration pads for isolating the foundation of a rather specialized instrument. We visualize these to be of a type similar to those described in Volume 22, Number 2, of the publication "Lead".

Kindly send available data and descriptive literature on your anti-vibration pads to my attention.

G. W. Langnick
Stellarator Associates

July 31, 1958

We would like some information concerning the lead anti-vibration pads which your company manufactures.

We have a problem of supporting 4 large chemical tanks which vibrate considerably. Each tank is supported on 6 pipe columns welded to 12" x 12" base plates and are anchored to concrete footings with 4 - 1" bolts.

We have designed the columns and have found that the vertical load is 37,000# on each column. This load would give a bearing value of about 250# per sq. in. on the base plate. The base plate will be resting on a pedestal 6" above the floor.

We would like to place a lead anti-vibration pad under each base plate. Would you please let us know as soon as possible the size of the pad we would have to specify to take the loading mentioned above. Please note that the pad will be resting on a pedestal and will not be encased in concrete.

F. J. Didio
Lockwood Greene Engineers, Inc.

July 29, 1958

We note an article in the Lead Industries Association's publication on anti-vibration pads as manufactured by your firm and used under the foundations for the Union Carbide Building, New York City. As we have occasional problems of vibration control, and this article states that these pads are effective in the resistance of transmission of vibration, we are interested in obtaining additional information on this product. Specifically, we would like technical data on the resistance to transmission of vibration, on the detailed construction of the anti-vibration mats, physical characteristics and load bearing capacity of your product. We would also like information on the cost per square foot.

John H. Bringhurst, Jr.
J. E. Sirrine Company

April 17, 1958

Please mail complete descriptive information and prices on Lead-Asbestos pads as used in Union Carbide Corporation Building at 270 Park Avenue.

R. B. Reid, General Purchasing Agent
By H. L. Hart
Bowaters Southern Paper Corporation

April 6, 1954

We are interested in performing tests of a product you may have and recommend for the vibration absorbtion of extremely heavy forging hammers and presses.

The material should be available in flat sheets approximately 5/8" thick for installation between the hammer base and the concrete footing. For the purpose of the test we would appreciate receiving a sample piece of the material at least 2" x 3" in size.

At this time we do not desire any Engineering service however, if after making our test we require more information, we will contact you.

Please advise description and price of the material you furnish.

C. Haigler, Purchasing Department
Ladish Co.