

LEAD INDUSTRIES ASSOCIATION

480 LEXINGTON AVENUE
NEW YORK 17, N. Y.

June 29, 1955

SUBJECT: LEAD SHIELDING BULLETIN SERIES

To Members of the Lead Industries Association:

Here are the first two of a new series of bulletins on lead shielding, prepared and issued by the Lead Industries Association for its members. This series will be devoted to various aspects of the use of lead in radiation protection and will be issued from time to time, as material develops, to members of the Association interested in the subject.

Therefore, will you kindly fill in and return the enclosed card to this office, signifying whether or not you wish to receive future Lead Shielding Bulletins as issued. If you wish others in your organization placed on this mailing list kindly add their names.

Very truly yours,

Robert L. Ziegler
Secretary.



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LEAD SUPPLYING BULLETIN NO. 1

FOR THE LEAD INDUSTRIES ASSOCIATION

To Members of the Lead Industries Association:

The Atomic Industrial Forum, Inc., a non-profit organization of 250 industrial and research companies set up to promote the industrial development of atomic energy, held a meeting in New York on May 23-24. A growth survey of the atomic industry for the period 1955 to 1965 was released projecting the next 5-10 year requirements for materials, equipment and personnel of an expanding atomic energy industry. Some interesting predictions based on the survey were that large reactor power plants will be economic by 1962; annual business of \$700 million in components for reactors by 1963; an investment of \$7 billion will be made in power reactors by 1965.

The survey and the rest of the information in this bulletin refers only to reactors designed and built for the generation of power by private industry. None of the data or information includes reactors operated by the Federal Government and by the military, nor do the shielding requirements take cognizance of the shielding needed in laboratory facilities for the handling of radioisotopes and for the shipping and storing of these materials. The full impact of the radioisotopes industry on the market for lead as a shielding material, it is the general consensus, has not as yet been fully realized. For example, according to "Iron Age" (June 1955), distribution of radioisotopes from the Oak Ridge Reactor began in the summer of 1946 and shipments soared from 250 during that year to over 11,000 (some \$30 million worth) in 1954.

For the 4-year period 1955-1958 private expenditures for reactor research development were estimated at \$150,000,000 compared with the government's anticipated expenditure of \$250,000,000 for the 5-year civilian power program begun in 1954. The most optimistic growth rates assume that research and development efforts will continue to increase in size and productivity until they double our current rate by 1956 and double again by 1958. While the more pessimistic growth rate assumes a smaller research effort it is believed that it will require at least doubling of the present rate by 1965.

During the next seven or perhaps ten years the largest equipment expenditure will be in the propulsion reactor field dominated by military requirements for submarines and aircraft. Expenditures directly on shielding in industrial reactor development in 1953 totaled \$10,000 out of a total of \$2,198,000. Radioisotope production and utilization on the part of industry accounted for expenditures of \$1,119,000 in 1953 and \$373,000 during the same period by institutions.



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It is felt in some quarters, although not officially expressed in the survey, that shielding requirements will be of much significance in waste handling and disposal. Radioactive wastes will be discharged from processing plants probably in solutions and concentrated, transported and stored for permanent retention. According to the survey, in 1964 a maximum of 7,000 KG of waste fission products and a minimum of 1,000 KG will be produced.

Speaking on the program of the Forum meeting, R. L. Mala and S. R. Randolph of Nuclear Development Associates reviewed the role of shielding in the atomic power industry. "In a mobile reactor shield lead may be a very useful material and it should also be considered for package reactors. It is the most effective of the common materials for stopping gamma rays but it is not a particularly good neutron shield . . ." "The most satisfactory high density shielding materials to date have been iron and steel. These are not as good from a gamma shielding standpoint as lead, but are likely to find widespread use in shields for power reactors because of their superior engineering properties. Except for special high temperature concrete, the use of concrete is restricted to relatively low temperatures (not above about 1500°)."

Speaking of the influences on the industries involved in shielding material manufacture, the authors felt that the quantities used in shields will be quite small compared to the total current production. For example, with the amount of concrete used in only a mile of modern super-highway, shielding for several reactors could be constructed. Furthermore, the number of reactors is a more pertinent index of shielding requirements than the total capacity in the case of the nuclear power industry. Noting the cost of the shield compared to the other components of the nuclear power plant they stated that about 25 percent of the cost is allotted to shielding and building and that about 40 percent of this would go to shielding alone.

In summary they said that "With few exceptions the industries which supply shielding materials are not likely to feel any large impact as a result of shielding requirements for the power reactor industry."

Yours very truly,

R. L. Mala
Secretary.