THIS LETTER WAS SENT TO THE CERAMICS TECHNICAL COMMITTEE ALSO

LEAD INDUSTRIES ASSOCIATION

60 EAST 42ND STREET

NEW YORK 17, N.Y.

July 26, 1957

SUBJECT: HANDLING LEAD COMPOUNDS IN THE CERAMIC INDUSTRIES

To Members of the Lead Industries Associations

Attached is a reprint with slight modifications of the chapter on the handling of lead compounds from our recent technical data book "Lead in the Ceramic Industries."

These reprints were prepared after consultation with several manufacturers of the new type lead bearing frits for use in porcelain enameling of aluminum and steel. It was designed to satisfy their expressed needs for something which would help them reassure their customers for there frits that they could be used safely and also to prevent their misuse which might be harmful to these new markets for lead.

These reprints are being supplied at no charge in quantity to the manufacturers of lead bearing frits who in turn are requested to distribute them to their customers using these frits. It is also designed to encourage these customers to get in touch with us for proper guidance if they do not know where to turn for expert advice.

Sincerely yours,

Robert L. Taylor

Secretary

HANDLING LEAD COMPOUNDS IN THE CERAMIC INDUSTRIES

Every type of lead material can be handled and controlled with safety if proper modern equipment is provided for the protection of the health of the industrial worker. This is borne out by the many plants that have as their primary function the processing and handling of lead and its compounds and do so with entire success and safety.

American industry has made spectacular progress in the past 25 years, and some of the greatest strides have been made in the field of materials handling. Conveying equipment, dust control systems and packaging convenience have changed the face of industry. Old style methods of handling raw materials with shovels in dusty, unventilated plants are as outmoded as they are inefficient. Today's management has available methods of operation that were not thought possible two decades ago. Modern management knows that a clean, well-ventilated plant with efficient material handling methods is essential for successful and profitable operations.

With the advent of hygienic plant controls, the general use of lead compounds in the ceramic industry is available with all of the recognized advantages of these versatile materials. Thus one of the oldest of the ceramic materials paradoxically becomes one of the newest. The ceramic engineer now has the practical advantage of safely using lead in ceramic coatings and ceramic bodies. Lower maturing temperatures, shorter firing cycles, wider firing ranges, decreased surface tension, high gloss, lowered bleb defects, low porosity, and stability of colored lead frits are benefits which may be exploited by using lead. The foolproof characteristic of lead reduces scrap loss and increases production yield. The savings in using lead far outweigh the cost of plant hygiene measures to insure safe use.

Industrial health precautions are by no means confined to the use of lead and its compounds. Silica, beryllium, cadmium, antimony, selenium, tellurium and other elements and compounds present extremely hazardous exposure problems. For example, Doctor W. Schweisheimer says in the September, 1954 issue, *American Glass Review*, "For several years a number of ceramic plants have been operated under contract to the Atomic Energy Commission to supply beryllium materials for the Commission projects." He quotes A. J. Breslin as stating in a recent study, "No cases of beryllium poisoning have occurred at the plants which have been operated in compliance with Commission recommendations." While we are primarily discussing the handling of lead compounds, it should be remembered that, basically, the same precautions are necessary in plants where no lead is now being used. Dust of any kind is likely to be a health hazard.

Proper handling of lead compounds in the ceramic industry requires:

1. Proper Plant Hygiene
2. Proper Instruction and Supervision of Workers
3. Regular Checks by Plant Physician or Medical Director

1. Proper Plant Hygiene

A. Adequate pre-employment examination of all plant workers. This should include previous working histories, chest X-rays, and blood examinations.

B. All operations which disperse dust should be controlled by closed systems or local exhaust ventilation.

Lead compounds for the ceramic user are conveniently packaged so that unloading, plant storage and movement to the location where the packages are to be emptied present no exposure problems.

Dust hoods should be located where dry materials are charged or discharged from processing equipment and should surround the operation as completely as possible. Air velocity of 200 linear feet per minute at the hood face is the generally accepted standard requirement. Exhaust from hood ventilating systems must be discharged outside of the plant, preferably into cloth-screen dust arrestors having not less than one-half square foot of effective area of cloth per cubic foot of dust-laden air per minute passing through it.

Bins, elevators, chutes, covered conveyors, covered mixers, etc. can usually be made dust-free by drawing off dust-laden air at critical points. By maintaining a slight negative pressure in the closed equip-

ment, some air may enter the system, but dust will not escape. Relatively small air volumes are required to achieve dustless operation for closed equipment. Exhausted dust-laden air should be properly filtered before discharge outside the plant.

Dust control and elimination are important to all industries today and there are many reliable and qualified manufacturers of equipment to do the job properly.

C. Only where local or general control is impossible, workers should be provided with respirators specifically approved by U. S. Bureau of Mines for this type of protection.

D. Adequate washroom facilities should be provided. Hot water and soap should be provided, along with individual hand towels. The hand towels may be paper. Shower facilities are recommended.

E. Proper locker room facilities should be provided. Workers handling toxic materials should have separate lockers for street clothes and work clothes to prevent contamination.

F. A suitable and separate place should be provided for the workers to eat.

No food should be eaten until the worker has washed and no eating should be allowed in the department or area where toxic materials are used. Workers should not smoke on the job while handling toxic materials.

2. Proper Instruction and Supervision

The purpose, correct use, and maintenance of respirators should be explained to the workers and *enforced*. There are several good types of approved respirators on the market. Be sure that workers are provided with respirators that fit the individual. Respirators assigned to one individual should be regarded as personal as a toothbrush and should not be interchanged. Respirators worn by a single workman usually tend to fit better and more comfortably after repeated use.

Spare respirator filters, head bands and other parts should be readily available. Respirators must be maintained in order to be effective.

Air supplied respirators are preferred where it is practical to use them as they are generally more comfortable and positive in their action.

Most authorities agree that the use of respirators is no substitute for adequate plant engineering. In practical plant operation, however, situations do arise during which engineering controls are being developed, or where repairs are necessary. The use of respirators in these situations is extremely important for proper plant hygiene.

3. Regular Checks by Plant Physician or Medical Director

Most practicing physicians these days rarely have occasion to treat cases of heavy metal intoxication or poisoning. Therefore the plant doctor should be informed of any toxic materials being handled. The plant doctor will then be in a position to study the problem and outline a regular safety program.

Reference: "Occupational Lead Exposure and Lead Poisoning," a booklet published by the American Public Health Association, 1790 Broadway, New York 19, N. Y., and available from them at 75c a copy, is considered the most comprehensive and authoritative reference of its scope on this subject.

There are both governmental and private agencies in many cities competent to evaluate and advise on engineering and medical control of lead. The Lead Industries Association will be glad to furnish information on such agencies.

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