Lead Industries Association, Inc.
292 Madison Avenue • New York, N. Y. 10017 • Telephone: (212) 679-6030

July 25, 1973

SUBJECT: PUBLICITY STATUS REPORT
SECOND QUARTER -- 1973

TO THE MEMBERS OF THE LEAD INDUSTRIES ASSOCIATION, INC.:

We are pleased to send for your review, the second quarterly report for 1973 on LIA publicity activities. Also included are photo copies of many of the articles from our scrapbook.

I would appreciate any comments you might have on this report, and would also be pleased to hear from you if you have suggestions for inclusion in our publicity program.

Very truly yours,

Jerome F. Smith

JFS:lm
Enclosure

Jerome F. Smith
Secretary & General Manager

LEAD INDUSTRIES ASSOCIATION
TRADE PUBLICITY PROGRAM
SECOND-QUARTER REPORT
April - July, 1973

Highlights of current publicity projects discussing lead applications.....in LEAD ACID BATTERIES:

* A feature story on the use of battery-powered special-purpose personnel carriers to replace internal combustion vehicles at Morton Salt Company's Painesville, Ohio mine -- deepest salt mine in U.S., published in SKILLINGS MINING REVIEW.

* Two articles concerning the use of battery-powered buses to help solve the nation's mass transit problems, have been published in AMERICAN METAL MARKET, MACHINE DESIGN, and THE NORTHERN MINER.

* A new 18-ft.-long pleasure boat that is expected to provide quiet for both fishermen and motor sailors. The recently-released article has been featured in THE BATTERY MAN and DESIGN NEWS magazines thus far.

A major release discussed the unique Consolidated Edison Cable Splicing School which specializes in joining, splicing and wiping UNDERGROUND ELECTRICAL CABLES.

* A two-page feature describing the school and highlighting how students are taught to wipe lead-sheathed cable joints was published in the May 1, 1973 issue of ELECTRICAL WORLD.

Feature articles on the use of SHEET LEAD SOUND BARRIERS for:

* A newly developed acoustical/thermal building panel used to quiet the sound of ductwork and fans at the Long Island Lighting Company's Northport, N.Y. plant. This story was the color-cover feature story of the May 15, 1973 issue of ELECTRICAL WORLD magazine and it was also featured as a one-page placement in PUBLIC UTILITIES FORTNIGHTLY, a two-page feature in METAL BUILDING REVIEW, a one-column feature in FACTORY, and a three-column feature in AMERICAN METAL MARKET.

* Montreal's Justice Building, which features the use of sheet lead sound barriers in the building's walls and at the partition line along the building's heating and air-conditioning system. Published in AMERICAN METAL MARKET.

A feature article concerning the introduction of LEAD CLAD STEEL was given prominent attention in such magazines as PURCHASING, MATERIALS ENGINEERING, PROGRESSIVE ARCHITECTURE, CHEMICAL EQUIPMENT and AMERICAN MACHINIST magazines.

Four recently-released feature articles, which have been distributed to a variety of monthly metalworking, design and engineering magazines, have been published in the daily newspaper, AMERICAN METAL MARKET.

The articles include such subjects as:

* LEAD SHIELDING used for nuclear medicine shipping containers and shields.

* LEAD CASTING used to produce an equestrian statue of the the last King of the Americas, King George III. Toppled from its pedestal by Revolutionary War patriots on July 9, 1776 and chopped to pieces to be used for bullets, parts of the statue were unearthed near Wilton, Conn., where they were believed to have been buried while enroute to a Continental Army armory.

* LEAD SOLDER PREFORMS used to mass-produce soldered joints for a variety of electronic and other products.

A feature article discussing the use of LEAD SHIELDING for an anti-skyjack X-ray device being tested for use at airports, has appeared in MACHINE DESIGN, SECONDARY RAW MATERIALS and ELECTRO-MECHANICAL DESIGN magazines. LEAD SHIELDING also was featured in a by-line feature by P.E. Robinson in AMERICAN METAL MARKET.

The fourth article to be published discussing the use of CHROME YELLOW PAINT to improve highway safety has been published as a three-page feature in AMERICAN PAINT JOURNAL magazine.

Publicity announcing the Annual Lead Industries Meeting appeared in such magazines as WASTE TRADE JOURNAL, IRON AGE, METALWORKING INTERNATIONAL, AMERICAN PAINT JOURNAL and in the AMERICAN METAL MARKET.

Releases announcing the re-election of D. Broward Craig to president and chairman of Lead Industries Association, Inc., appeared in more than 20 publications including MINING CONGRESS JOURNAL, AMERICAN METAL MARKET, SCRAP AGE, THE NORTHERN MINER, and ADVANCED BATTERY TECHNOLOGY.

The news release announcing the Second International Soldering Conference, which was jointly sponsored by the Lead Industries Association and the American Welding Society, appeared in more than 10 magazines including IRON AGE, WELDING JOURNAL, DESIGN NEWS, WELDING DESIGN & FABRICATION and AMERICAN METAL MARKET.

Eight papers concerning the use of lead in a variety of products and its availability were delivered during the Annual Meeting. More than 130 copies of the papers have been delivered to various editors.

Two literature availability notices were published in various magazines during the reporting period:

* "Publications and Films" was published in more than 5 magazines.

* "Lead -- A Modern Design Material" was published in more than 25 magazines.

Watch for publication of the following ready-for-distribution feature articles:

* Ninety Tons of Lead Batteries Provide Uninterruptible Back-Up Power For IBM Computers

* New Motorola "Tweeter" Loudspeakers Feature Use of Lead Zirconate-Titanate

* The Extensive Use of Massive Extruded Lead Tubes For New Copper Mine Acid Mist Precipitator

* The Use of Lead Acid Batteries To Power New England Flood Warning System

Second Quarter
Summary of Publicity Activities

Feature Articles Published	19
News Articles Published (including literature availability announcements)	60
Feature Articles Completed	8
News Release Completed (including personnel announcements and literature availability announcements)	10
Feature Articles in Preparation	7
Editorial Request Responses	146 *

* NOTE: This figure includes the more than 130 copies of papers delivered during the Annual Meeting provided to editors at their specific request.

Skillings' Mining Review
MAY 12, 1973

Battery-Powered Personnel Carriers at Morton Salt Mine

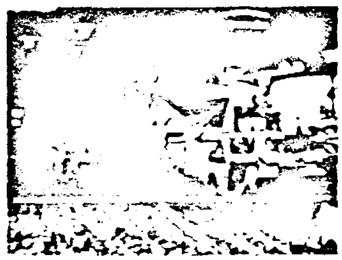
At Painesville, Ohio, Morton Salt Co. operates the deepest salt mine in the U. S. to produce about 1.5 million tons of rock salt a year. The 2000-ft deep mine, situated on the shore of Lake Erie, about 30 miles east of Cleveland, also has the distinction of tapping a vast bed of what is believed to be the world's largest deposit of rock salt. The bed covers an area of about 100,000 square miles of rock salt, and it extends under Lake Erie, into Canada as far as southern Ontario, and diagonally across the U. S. as far south as West Virginia.

At Morton's Painesville mine, salt is mined by the room-and-pillar method. In this mining technique, about half the rock salt is removed from the working face of the mine whereas the remainder is left in the form of pillars to support the mine roof. The first step in mining salt at Painesville is blasting. A 10-ft deep undercut is made at the base of the work face, and a series of multiple holes for explosives are drilled mechanically over the same distance into the face of the wall. The work face is blasted at the end of a work shift, providing about 500 tons of rock salt to be processed by the next work shift.

Supervisory personnel play an important role in the safe and efficient operation of the mine. One of their more important jobs is to check the work face to see that it has been properly undercut at the base, and to ensure that the holes for the explosives have been drilled properly and placed. Just as important, the supervisors also check to see that the explosives have been set properly before the work face is blasted. Because the work face being blasted can cover as much as 4000 ft., the supervisors must be transported quickly from one point to another along the work face.

Until recently, supervisory personnel were transported to and from work face areas by diesel-powered personnel carriers. A maintenance crew, operating from an underground shop on the mine's working level, also used the carriers for transportation to and from job assignments. In addition, (Continued on page 8)

Scene of a specially-designed machine undercutting the base of a rock salt work face to 10 ft. deep at Morton Salt Co.'s mine at Painesville, Ohio. At the end of a work shift, the face is blasted to provide about 500 tons of rock salt for initial processing underground before being hoisted to surface for additional treatment.



View of three of the five new battery-powered electric personnel carriers purchased by Morton Salt Co. to replace diesel-powered vehicles at its salt mine at Painesville, Ohio. The units are shown awaiting check-out at the motor pool, situated at the 2000-ft. deep working level of the mine.

The electric vehicles in service at the Painesville mine are designed to embody features of quiet operation, comfort, rugged construction, and give maximum distance between battery charges. The mechanical design of the vehicles is simple and requires a minimum of maintenance. The batteries used to power the smallest of the new vehicles are 6-volt. The batteries range in amps from 190 to 225 and, unlike automobile batteries, they take repeated deep cycling, or charging and discharging. The largest of the five vehicles is powered by a 36-volt, d.c. traction-type motor that transmits power to a worm gear differential through a matched set of three drive belts.

AUTOMATIC BATTERY CHARGER EMPLOYED

An automatic battery charger has been incorporated in the design of

Storage area for the 1.5 million tons of salt mined annually at Morton Salt Co.'s mine at Painesville, Ohio. When not in use, the stockpile, situated outdoors, is covered with a tarpaulin.

the five vehicles, and it is a rugged and dependable piece of equipment. Vehicle maintenance personnel check the water level in each of the lead acid battery cells at least once a week, refilling them with water when required. They also add water at the end of the charging period, rather than at the beginning, to avoid the possibility of the solution boiling over because of heat expansion during the charging period. In addition to their use in transporting supervisors, the electric vehicles are used to transport personnel who supervise the first phase processing the rock salt undergoes after it is blasted from the work face. Performed by portable equipment temporarily installed adjacent to the work face, the first phase processing includes crushing large chunks of rock salt and screening them to uniform size.

The uniform-size rock salt is hoisted to the surface where it is screened and processed further. Some of the salt is packaged in a variety of grades and container sizes, but most of it is transferred to large storage silos or piles to await shipment. Salt from Morton's Painesville mine primarily is used to melt snow and ice from streets and highways in a wide area extending from states bordering the Great Lakes to those in the northeast and as far into the southern region as West Virginia. Some of the salt from the Painesville mine also is used for a variety of agricultural and industrial purposes.

Feature article:

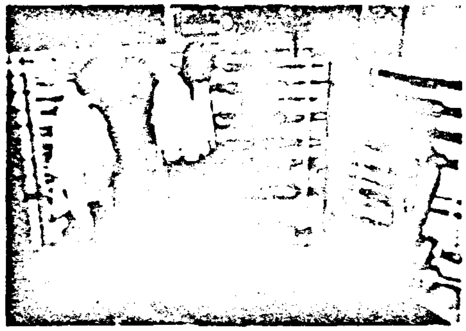
Battery-Powered Personnel Carriers Replace Internal Combustion Vehicles at Morton Company Salt Mine

Published in:

SKILLINGS MINING REVIEW

May 12, 1973

Electrical World



[illegible]

'Hands-on' training for lead-sheath wiped joints

As part of the continuous effort required to ensure that its underground power-distribution system operates as efficiently as possible, Consolidated Edison Co of N.Y. has developed what may be the utility industry's most comprehensive training department. The department has set up several highly specialized training schools designed to train both its own employees and those of other utilities—as far away as Hawaii—in the art of installing and maintaining the wide variety of components that make up a utility's distribution system.

One of the training schools is the Consolidated Edison Cable Splicing School. It is the most extensive of its type in the country, and is, as far as is known, the only one of its kind operated by a utility on such a large scale for trainees of other utilities.

The school is primarily designed to train experts in the combined art of splicing lead-sheathed underground electric cable, and then soldering the spliced joint in such a manner that it will form a watertight seal that is as strong and corrosion-resistant as the cable's protective lead sheathing.

The school's curriculum is divided into three courses. The first runs from eight to ten weeks, and is designed to teach the basics of splicing underground power-distribution cable. The second is a six-month field training program, where cable-splicing techniques learned during the first course are practiced during supervised on-the-job assignments. The third course is a three-week advanced program.

The courses are a combination of practical applications of theory lectures, and "hands-on" methods used to simulate field conditions. The methods and curriculum employed have been tried and proved through the many years the school has been in existence. Henry Harding, training administrator for all the school's electrical construction, has 22 years of experience, and Mike Costa, senior training representative in charge of the cable-splicing school, can trace his working experience with Consolidated Edison back to 1929. The school has a permanent staff of six, augmented by additional training personnel as needed.

The most comprehensive and diverse schooling is taught during the initial eight-to-ten-week basic course. While the trainees are primarily instructed in the various ways of connecting lead-sheathed cable, they also receive instruction on how to splice non-sheathed cable. In addition, they are taught to splice copper and aluminum conductors and concentric cable joints for direct current, and to construct cable terminals.

"Lead-sheathed cable is still the most effective type of protected cable for use in underground distribution systems," says Costa. "Lead sheathing on cable is able to withstand the enormous amount of abuse that is encountered when the cable is being installed. Its corrosion resistance and ability to be easily and successfully joined are added benefits."

The trainees learn how to make 26 different high-voltage lead-sheathed-cable joints during the basic course. The joints range from the least difficult, such as installing a 2½ x 11-in. lead sleeve over a joint in a 350-kcmil, 5-kv cable, to installing a 5¾ x 28-in. lead sleeve over a 3-conductor, 500-kcmil, 27-kv to a 3-single 500 kcmil—better known as a 3-way, 1-joint.

Because Consolidated Edison faces the task of installing and maintaining literally millions of soldered, lead-sheathed cable joints, most of the space at the Cable Splicing School is taken up by areas where "in the bench" splicing and soldering instruction takes place. Each work area has its own separate electrical cable jigs and pots of solder, which is kept liquid and ready for use. Students working at the benches are under constant supervision of experienced instructors, who have prepared detailed drawings and specifications for each of the joints the students make during the 10-week course (see boxed copy below for representative "wiped" joint proce-

One of six permanent instructors in the training program, Robert Arouse, monitors trainee Bernard Curry as he makes one of many lead wiped joints representative of those used on Consolidated Edison's underground-distribution cable system.

dure). The students also learn how to "break down" each type of soldered joint taught at the school, since they would have to accomplish this phase of work before repairing a joint that failed in the field.

The school's three-week advanced course in cable splicing is conducted after the trainees have satisfactorily completed their six months of field training, following completion of the 10-week primary course. The advanced course includes instructions on how to make the complicated 4-way, 1-way 13-kv and 27-kv splices. The trainees make each type of joint three times, and then each joint is stripped (the lead around the joint is heated and wiped completely off) and broken completely down under the supervision of an instructor.

Advanced course trainees also are required to splice a secondary 120-v 'live' main, using all necessary safety equipment and procedures.

Other training programs at the school include a 10-day course in transmission splicing, which is designed for experienced underground distribution splicers, a five-day course for transmission splicer's helpers, and a three-day underground-residential distribution (URD) course. Also available are general training programs that include a refresher course in cable splicing and a five-day trouble-man course that is designed to further acquaint experienced electricians and cable-splicers with the various emergency situations they can expect to encounter in the field.

Approximately 300 students complete the Cable Splicing School's course each year. The utility's total on-the-job training program spans an approximate five-year period. After this period the utility's cable-splicers earn a minimum of slightly more than $13,800 a year. ■

Procedure for wiping a joint

Joints of lead-sheathed cable, because of the increased bulk of the spliced conductors, are always of greater diameter than the cable itself, and therefore require the use of a lead sleeve to encompass the joint. The school orders the lead sleeves in 2½-in. to 5-in. diameters, to splice cable ranging from a minimum of 5 kv to a maximum of 27 kv. For ease in handling, the sleeves are usually ordered in 32-in. lengths, which are cut to size as required.

Having selected the proper sleeve length for the electrical joint to be made the student scrapes the inside of both ends of the sleeve clean back about 1 in. before fluxing with tallow or stearic acid. The outside of the sleeving, back about 2 in. to 3 in. depending on the diameter, is also scraped clean and fluxed.

After the sleeve is slid up over the conductors, the ends of the sleeve are preformed to fit the approximate shape of each end of the spliced area. This step, called dressing, is accomplished with a wooden mallet or dresser. The sleeve is then moved aside while the conductors are spliced.

Following this step, areas on the cable's lead sheathing that are to become part of each joint are scraped clean and fluxed. The sleeve is then placed over the center of the joint so that each end extends over the previously scraped and fluxed lead sheathing around the cable.

The dresser is usually used to tap each end of the sleeve into place to fit snugly against the cleaned and fluxed areas of the lead sheathing around the cable. An additional thin coating of flux is applied to the area before gummed paper or plumber's soil is applied to prevent adherence of solder at points beyond the joints.

When the joint has been properly prepared, it is joined by the special technique called wiping. Wiping requires special lead solders to achieve a smooth, watertight joint.

The technique of wiping a lead-solder joint requires a great deal of skill, and students in the school spend many hours practicing it. First, molten solder is poured around the joint formed by the lead sleeve and the lead sheath of the cable and sleeve. A cloth held by hand just below the bottom area is used to allow the solder to flow over the bottom surfaces until it adheres to the cleaned and fluxed areas.

After the lead from the first pour has cooled to the point where it reaches the pasty, or working, range, additional solder is poured over the top and bottom areas. This solder also is permitted to cool to the working range before an additional pour is made. The process is rapidly repeated, with one hand pouring solder from a ladle and the other simultaneously wiping the joint as the solder builds up, until the joint is the desired thickness. At this point, the joint is smoothed and finished by a final wiping.

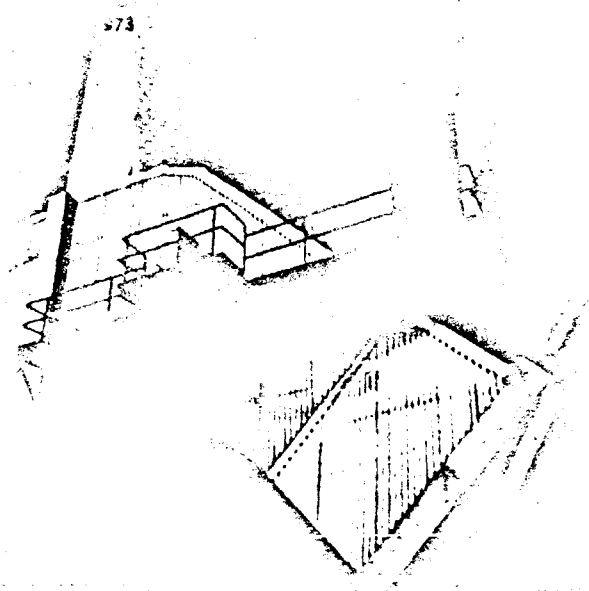
Exclusive feature story for:

ELECTRICAL WORLD -- May 1, 1973

Consolidated Edison's Lead Cable Splicing School

NOTE: ELECTRICAL WORLD carried color-cover feature story on the use of sheet lead to quiet Long Island Lighting Company facility in the magazine's following issue, May 15, 1973.

LIA14997



COVER STORY FEATURE ---

Use of sheet lead to quiet sound of Long Island Lighting Company Facility.....

One of six feature placements

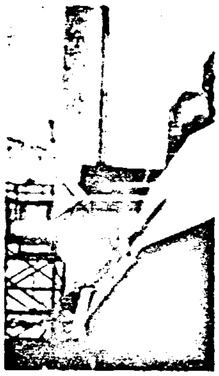
ELECTRICAL WORLD - May 15, 1973

NOTE: This feature placement has been reprinted for use in the LIA promotional program directed to the sound control market.

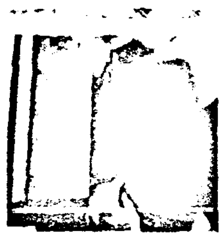
LIA14998

Bedroom community's quiet undisturbed

[illegible]



[illegible]



[illegible]

25.77 PUBLIC UTILITIES FORTNIGHTLY
MAY 10 1973

A Case History in Industrial Noise Control

PROBLEM: How to increase the capacity of a large electrical generating plant in the midst of a "bedroom" residential community without generating huge noise problems as well.

Solution: Extensive use of sound barriers along with a modified air intake—both relying primarily on lead.

As a result, the Long Island Lighting Company (LILCO) power plant in Northport, N.Y., is one of the utility industry's quietest fossil-fuel power generating stations. There are three power generation units at the utility's Northport plant and each unit is designed to produce 600 megawatts of electrical power for the LILCO system.

According to Lead Industries Association, sheet lead is being used extensively in a primary sound barrier in a newly developed combination thermal-acoustic building panel. The panels are being used to build sound-deadening enclosures around new equipment in order to bring the Northport facility into conformance with the strict noise control specifications set by the utility when the plant was built.

"Super Quiet" Location

Situated on Long Island Sound, the plant is flanked on three sides by a very quiet suburban residential community. It contains more than 700 homes, some of which are as close as 1,200 feet to the power station structures.

Use of Sheet Lead to quiet sound of Long Island Lighting Company facility.....

one of six feature placements

PUBLIC UTILITIES FORTNIGHTLY May 1973

level compares to that heard inside a quiet living room.

Because of these low ambient decibel levels, LILCO engineers faced a particularly difficult noise control problem when the first two units were being designed. They knew that operation of the machinery and associated equipment for the two units would produce sounds in the high 90 to 150 dbC levels and that such levels would be particularly annoying to homeowners in the surrounding community. Further complicating the problem was the fact that such sound would travel far in the quiet suburban atmosphere of the surrounding community.

Studies of sound levels in 1963 of the surrounding community determined that a 3.5 decibel increase in ambient sound levels would be acceptable and avoid widespread noise complaints from homeowners. Therefore, when the plant was being designed, LILCO specified that noise from the plant could not exceed 70 dbC outside the plant walls and 90 dbC outside the exhaust duct work and walls of the mechanical particulate collectors of each unit. These goals were accomplished through four basic steps:

- Various equipment inside the plant was purchased with the most practicable low sound level, or else was enclosed in standard sound-deadening materials.
- Wherever needed, walls and ceilings inside the plant were covered with sound-absorbing panels and materials.
- The entire plant was enclosed in sound-deadening walls and exterior panels.
- Acoustic silencers were provided for forced draft fans and ventilating systems.

As a result, LILCO was not concerned with noise complaints from the surrounding community until a recent decision was made to install the new induced-draft fan equipment in Unit No. 1. Because of their large size, the fans and their associated duct-work could not be installed inside the plant. Thus the existing plant walls could not be used even to partially attenuate sound.

A 600-foot high emission stack, connected to the induced-draft fan by huge ducts, was found to be the primary noise source. However, after adequately filtering noise exiting from the top of the stack, it was determined that a new primary noise source requiring acoustical treatment was the induced-draft fan casings and duct-work leading to and from them.

Sound Reduction

According to Frank J. Wells of LILCO's electrical engineering staff, the steel enclosures for the duct-work and fan housing provided a very large sound reducing surface much like that of a gigantic loud speaker system. Therefore, the decision was made to enclose both the fan housing and the associated duct-work with a sound barrier system.

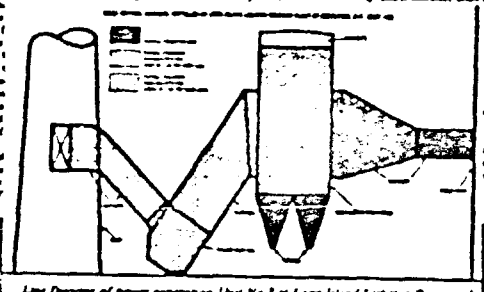
Several problems had to be overcome before the noise barrier could be installed. It had to be able to withstand the approximately 450°F operating temperatures of the equipment, and it had to be capable of providing an adequate degree of sound attenuation since noise levels were not consistent throughout all areas to be covered.

To help solve the problem, the utility called on the services of Transco Inc., in Chicago. A leading manufacturer of porcelain-cased, thermal insulation panels, the company has recently developed two types of insulated panels that are specifically designed to provide a sound transmission loss of up to 52 decibels. Transco has installed its standard thermal insulation panels at more than 50 electrical power plants throughout the country as well as more than a score of other types of industrial plants. LILCO's Northport plant was the first application for the company's combination thermal-acoustical panel system.

METAL BUILDING REVIEW
MAY 1973

Frank J. Wolk, LILCO Electrical Engineering Staff, displays cut-away of one of the two types of thermal acoustical panels that solved major noise problems at company's Northport plant. Panels contain 1 lb. sheet lead sound barrier, seen as reading from bottom to top, layers of mineral wool which provides panel with thermal insulating properties. Some of the equipment covered by the panels can be seen in background.

Two views of combustion turbine generator being assembled to silence equipment being installed at Unit No.3. Left view shows duct-work leading from enclosed draft fan equipment to unit's 600' high stack. Right view shows construction of panels covering additional duct-work leading to stack, panels covering enclosed draft fan housing (bottom, center), and duct-work from precipitator to fan (right center). Lower walls of precipitator housing (partly visible at bottom right) also were enclosed with panels. Exposed stack and other equipment for Unit No.3 is visible in background.



Line Drawing of power generation Unit No.3 at Long Island Lighting Company's Northport, N.Y., plant shows location of three types of composite acoustical building panels used to solve noise control problems for the installation's exterior duct-work and accessory equipment.

LIGHTING COMPANY'S NORTHPORT, N.Y. PLANT IS A CASE HISTORY FOR INDUSTRIAL NOISE CONTROL

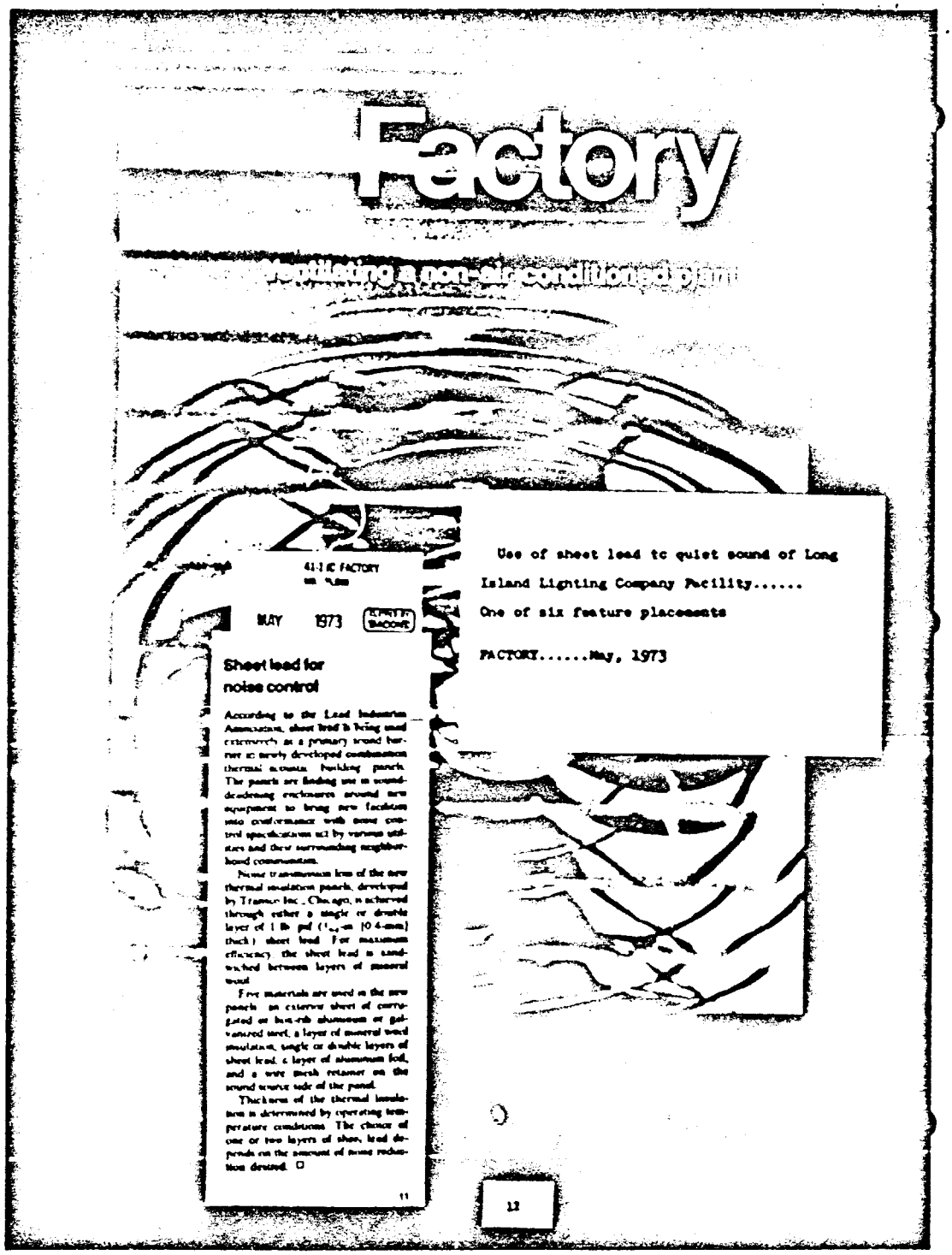
A release from the Lead Industries Association, 292 Madison Avenue, New York 10017

Use of sheet lead to quiet sound of Long Island Lighting Company Facility.....

One of six feature placements

METAL BUILDING REVIEW - May 1973

LIA15001


Factory
41-1 IC FACTORY
MAY 1973
Sheet lead for noise control
According to the Lead Industries Association, sheet lead is being used extensively as a primary sound barrier in newly developed combination thermal acoustic building panels. The panels are finding use in sound-deadening enclosures around noisy equipment to bring new facilities into conformance with noise control specifications set by various utilities and their surrounding neighborhood communities.
Noise transmission loss of the new thermal insulation panels, developed by Transco Inc., Chicago, is achieved through either a single or double layer of 1 lb psf (1/64-in [0.4-mm] thick) sheet lead. For maximum efficiency, the sheet lead is sandwiched between layers of mineral wool.
Five materials are used in the new panels: an exterior sheet of corrugated or box-rib aluminum or galvanized steel, a layer of mineral wool insulation, single or double layers of sheet lead, a layer of aluminum foil, and a wire mesh retainer on the sound source side of the panel.
Thickness of the thermal insulation is determined by operating temperature conditions. The choice of one or two layers of sheet lead depends on the amount of noise reduction desired. □
11
Use of sheet lead tc quiet sound of Long Island Lighting Company Facility.....
One of six feature placements
FACTORY.....May, 1973
12

METAL MARKET
MAR 20 1973

LIA Believes Sound Barrier Application To Boost Markets

NEW YORK – The domestic lead industry appears confident that lead will become an integral part of industrial noise pollution control systems.

The Lead Industries Association said that a growing number of large electrical generating plants, located in residential communities, are having a problem increasing capacity without increasing noise levels above Occupational Safety & Health Administration, and Local standards.

LIA reports that one solution to the problem is the use of sound barriers along with a modified air intake system, both of which primarily use lead.

With these systems the Long Island Lighting Co (Lilco) power plant at Northport, N.Y. has been cited as the quietest fossil-fuel power generating station in the country. With lead systems Lilco has been able to increase generating capacity without greatly increasing noise levels.

According to the LIA sheet lead is being used extensively as a premium sound barrier as a newly developed combination thermal acoustic insulating panel.

The panels are being used to insure sound-deadening performance around new equipment in order to bring the Northport facility into conformance with the most recent noise control standards. The LIA believes that this application for the metal will become a growing market for lead.

Situated on Long Island Sound, the plant is flanked on three sides by a quiet suburban residential community.

Monitored ambient sound levels in the immediately surrounding town, a sleep population of almost 20 decibels at night to a daytime high of almost 50 decibels.

Because of these low ambient decibel levels, Lilco engineers faced a particularly difficult noise control problem when the first two units were being designed. They knew that operations of the machinery and associated equipment for the new units would produce sounds in the high 90 to 100 decibels levels and that such levels would be particularly annoying to homeowners in the surrounding community. Further complicating the problem was the fact that such sound would travel far in the quiet suburban atmosphere of the surrounding community.

Studies of sound levels in 1968 of the surrounding community determined that a 3.6 decibel increase in ambient sound levels would be acceptable and avoid widespread noise complaints from homeowners. Therefore when the plant was being designed, Lilco specified that noise from the plant could not exceed 70 decibels outside the plant walls and 50 decibels outside the suburban dwellings and walls of the environmental particulate collectors of each unit.

As a result, Lilco was not concerned with noise complaints from the surrounding community until the recent decision was made to install the low induced draft (I.D.) fan equipment. Because of their large size the I.D. fans and their associated ductwork could not be installed inside the plant.

Thus, reinforced vaults, the ductwork on the exhaust side of the induced draft fans installed presented an average reading of 120 decibels a level far in excess of the original 90 decibels level set for noise outside the plant wall. As an indication of what the 120 decibel level means, it can be compared to the sound of low-flying jet plane and it is on the threshold of pain for the human ear.

A 600 foot high emission stack, connected to the induced draft fan by huge ducts, was found to be the primary noise source. Moreover after subsequently filtering noise emanating from the top of the stack, it was determined that a third primary noise source requiring acoustical treatment was the induced draft fan casings and ductwork leading to and from them.

According to Frank J. Wells of Lilco's electrical engineering staff the steel enclosures for the ductwork and fan housing provided a very large sound reducing surface much like that of a gigantic loud speaker system. Therefore the decision was made to enclose both the fan housing and the associated ductwork with a sound barrier system.

Several problems had to be overcome before the sound barrier could be installed. It had to be able to withstand the approximately 250 degree F operating temperatures of the equipment and it had to be capable of providing an adequate degree of sound attenuation since noise levels were not consistent throughout all areas to be covered.

To help solve the problems, the utility called on the services of Trabon Inc., Chicago Ill. A manufacturer of prefabricated thermal insulation panels, the company has recently developed two types of insulated panels that are specifically designed to provide a sound transmission loss of up to 50 decibels.

Trabon has installed its standard thermal insulation panels at more than 50 electrical power plants throughout the country as well as more than a score of other types of industrial plants. Lilco's Northport plant is the first application for the company's combination thermal/acoustical panel system.

Specifications of the new panels require to achieved through the use of either a single or double layer of one pound per square foot sheet lead. The sheet lead is sandwiched between layers of the mineral wool that is one of the standard materials used to produce the company's thermal insulation panels.

Initial Release on use of sheet lead to quiet sound of Long Island Lighting Company Facility

Published in American Metal Market
March 20, 1973

NOTE: Publication in daily newspaper followed by large number of magazine feature placements.

News Article: Availability of Lead-Clad Steel Announced

Samples of news item placements -- published in PROGRESSIVE ARCHITECTURE, TECHNICAL SURVEY, AUTOMOTIVE INDUSTRY, CHEMICAL EQUIPMENT, AMERICAN MACHINIST

CHEMICAL EQUIPMENT

MAR 1973 BURRELLE'S

CHEMICAL EQUIPMENT

MATERIALS OF CONSTRUCTION

LEAD CLAD COMPOSITE

Composite material combines lead's outstanding corrosion resistance with the strength of steel. Called roll bonded lead clad steel, material is produced by pressure bonding lead to steel sheets which have been pre-coated with lead alloy. Material possesses excellent properties for chemical construction. Applications include panels and small deep-drawn containers from sheet as well as flanged duct sections and spirally wrapped tubing. Development of lead clad steel for tank panels is important since sheet lead is already being used to line a variety of chemical and pollution control vessels. Lead Industries Association, Inc.

AMERICAN MACHINIST
NEW YORK, N. Y.
BI-WEEKLY

MAR 5 1973

AM Trends Materials

AUTOMOTIVE INDUSTRIES INTERNATIONAL

MAR 1 1973 BURRELLE'S

Lead Clad Material in England

A new composite material that combines lead's corrosion resistance and sound barrier properties with the strength of steel has been introduced in England.

Called roll bonded lead clad steel, the new composite material was developed by the British Non-Ferrous Metals Research Assoc. It is produced by pressure bonding lead to steel sheets which have been pre-coated with lead alloy. The lead clad steel is said to have been subjected to extensive mechanical and thermal testing without bond failure.

Advantages are claimed for roll bonded lead clad steel as a sound barrier material. Potential applications include ductwork for air, liquid and semi-solid handling systems, industrial machinery and equipment enclosures, and a variety of automotive transportation equipment.

PROGRESSIVE ARCHITECTURE

APR 1973 BURRELLE'S

Like-lead. A composite material reportedly combines lead's outstanding corrosion resistance, aesthetic appeal and sound barrier properties with the strength of steel. Called roll-bonded lead-clad steel, the material was developed in England. It is produced by pressure bonding lead to steel sheets which have been precoated with lead alloy. The lead-clad steel has been subjected to extensive mechanical and thermal testing without bond failure. It can be fabricated using traditional steel fabricating techniques and has been successfully used for commercial and industrial building construction applications. It is suitable for roofing, siding and chemical construction. Lead Industries Association, Inc. Circle 100 on reader service card

---

Cladding controls corrosion—and noise

A different kind of "composite" material combining the structural strength of steel with the corrosion resistance, appearance, and sound-barrier qualities of lead has been developed by the British Nonferrous Metals Research Assoc. As its name suggests, roll-bonded lead-clad steel is produced by cold rolling milled lead sheet to [illegible]-coated steel.

The pressure-bonded material is being offered in the United Kingdom with both single and double cladding and has already found application in exterior construction applications. Other possible uses include ventilation equipment, ductwork for materials handling systems, enclosures for industrial machinery, even home-appliance housings. Single-clad sheets are being produced with lead coatings ranging from 0.020 to 0.[illegible] in thick on 14- to 20-gage steel. Sheets with thicker coatings are being investigated for use in lead-lined vessels and other chemical plant equipment.

Although some minor tooling modifications may be required, it is reported that roll-bonded lead-clad steel can be formed by deep-drawing, roll forming, brake pressing, and [illegible] forming without delamination, even at [illegible] bends. Fabrication by soldering or brazing is about as easy as using sheet lead, and where steel-to-steel joints are required, lead and projection welding are satisfactory.

American lead producers have expressed interest in producing lead-clad steel for the domestic market, according to the Lead Industries Assoc., and no wonder. Last month the price of lead was restored to 15¢/lb. [illegible] August '72 level before Asarco started cutting prices [illegible] discount [illegible].

TECHNICAL SURVEY
WKLY.

APR 7 1973 BURRELLE'S

GB's Mullard Res Labs' expd, inexpensive Doppler radar intruder alarm uses thin-film microwave circuit techniques. A Gunn oscillator, a Schottky detector and a circulator to separate the transmitted and received signals--all are integrated in a thin-film circuit on a single 1-sq-cm ferrite substrate (13b) ... .A new Brit construction material, roll-bonded, lead-clad steel, is being used to form the vertical roof fascia panels on a London b[illegible] were formed by pressure-bonding lead to steel sheets that had been precoated w[illegible]oy (15a)

News Article: Availability of Lead-Clad Steel Announced

Two examples of feature placement --

PURCHASING MAGAZINE, March, 1973
MATERIALS ENGINEERING, March, 1973

7135 PURCHASING MAGAZINE
MAR 20 1973

TECHNOLOGY TRENDS

Many uses seen for lead-clad steel

material. It can be soldered, brazed and burned almost as easily as sheet lead.

For information write to Lead Industries Assn., Inc., 292 Madison Ave., New York, N.Y. 10017.

A COMPOSITE MATERIAL, developed in England, combines the strength of steel with the corrosion resistance, thermal barrier properties, and esthetic appeal of lead.

Roll bonded, lead-clad steel was developed by the British Nonferrous Metals Research Assn. and is produced by pressure-bonding lead to steel sheets coated with a lead alloy. The material takes extensive mechanical and thermal torture without bond failure. It can be fabricated with traditional techniques. U.S. lead companies are considering the material for industrial and construction uses.

Potential applications include small, deep-drawn containers, flanged duct sections and spirally wrapped tubing. Use of the material for tank panels should be significant, since sheet lead already is being used to line chemical and pollution control vessels. The material is expected to find use in sound-deadening enclosures for home appliances, air-handling equipment and industrial machinery.

The lead-clad steel is being produced in Britain. Single side clad sheet is available immediately, while double-clad is produced to special order. Coatings range from 0.020 to 0.060", applied to steel from 14 to 20 gage. Thicker coatings are being explored for chemical applications.

Standard fabricating techniques such as roll forming, brake pressing, lock forming and deep drawing can be used on lead-clad steel. It can be heat through 176F without loss of adhesion and with normally acceptable thinning of the lead on the outer surface of the bend.

Many types of fasteners can be used for joining the

MAR 1973

Three steel composites keep machinery quiet

Three composite materials, all using at least one layer or sheet of steel, substantially reduce noise emanating from a wide range of machinery. Combinations of steel and fiberglass, steel and lead, and steel and an adhesive have been developed and are now commercially available.

Working on the principle of constrained layer damping, U.S. Steel's Nudamp consists of a thin sheet of steel to which a sheet of thermoplastic viscoelastic adhesive is laminated. The resultant material is then bonded to the offending vibrating panel, housing or enclosure. Holes or indentations are then designed as a small amount of lead. The new damping panel may be attached to wood, metal or glass with adhesives, mechanical fasteners or heat bonding. The resultant laminate is effective to 300 F.

Other potential applications for Nudamp include automotive components, air compressor housings, parts hoppers, transformer housings and conveyors. Circle 186

Another approach is a combination of steel sheet perforated with thousands of minute holes placed over 6 in. layers of fiberglass. According to Diamond Perforated Metals Div. of Whittaker, noises are trapped and damped out by the fiberglass. The perforated metal has several functions. It enables the noise to reach the fiberglass through the perforations, protects the fiberglass and adds strength to large enclosure panels.

Enclosures measuring 100 ft long, 20 ft wide and 30 ft high for turbomachinery have been built and noise levels have been cut by 40 dB. The material is also a practical silencer for air intakes and exhausts. Circle 186

lead-clad steel is a ... duced in England and ... is produced by bonding lead to steel which has been precoated with lead alloys. The lead clad sheet has shown no failures after extensive mechanical and thermal tests, according to the Lead Industries Assn.

Lead cladding may be applied to one or both sides of sheet steel. Single cladding is being produced with lead coatings that range from 0.020 in. to 0.040 in. applied to 14- to 20 gage steel. Cladding between 0.020 and 0.030 in. on 20-gage steel is standard for building applications.

Standard roll forming, brake pressing, lock forming and deep drawing techniques can be used to fabricate lead clad steel. However, as with most new materials, some minor initial tooling modifications may be needed to accommodate the composite material. Most mechanical fasteners may be used.

Potential applications include appliance enclosures, ductwork for air, liquid and semi-solid handling systems, industrial machinery enclosures and in a variety of automotive applications. Circle 187

METALWORKING NEWS
NEW YORK, N. Y.

FEB 26 1973

Nuclear Medicine May Be the 'Doctor' To Give Lead Industry That Robust Look

NEW YORK — While lead is taking a beating in some fields, due to environmental considerations, one bright spot for expanding consumption could be nuclear medicine.

The Lead Industries Association backed up this claim by pointing to the inherent dangers involved in using normal materials to protect the hospitals.

Nuclear medicine has been used to diagnose internal cancer.

The process involves the injection of minute amounts of radioisotopes into the body.

The process has the advantages over X-rays by being more precise in locating the diseased area and determining the effectiveness of treatment.

But this process has one particular major disadvantage — radiation.

Various techniques have been developed to protect persons involved in nuclear isotopes from radiation.

Lead specialists are optimistic over the fact that lead is currently the leading contender as the material to shield persons from nuclear radiation.

According to the Atomic Energy Commission, when other shield materials are considered, "comparisons are usually expressed in terms of lead because it represents the best practical shield for most applications."

Among other things, the AEC is responsible for establishing the radiation limits permitted in nuclear medicine. Increasing doctors specializing in this science and determining the thickness of shielding material for such applications as the lead shielding devices for radiopharmaceuticals.

Protective shields are required from the time the nuclear materials are shipped from the manufacturer until they are injected into the body. For example, the material is shipped to the user in special lead shielded devices.

Lead To The Rescue

Other special shielding devices are needed to store the material, and the storage shields themselves are in turn stored in lead-lined safes.

When the radio active material is being transferred from one shield device to another, the action takes place inside a radiation lead-proof, lead lined glove box, and technicians using 8 mm lead-impregnated gloves. Radiation protection in the form of hypodermic needle shields are used for nuclear medicine.

As the use of nuclear medicine expands the LIA predicts a dramatic growth of lead consumption in this field. However the LIA declined to give specific figures.

A number of companies are specializing in developing and producing nuclear medicine products. A leading firm in the field is Atomic Development Corp., Plainview, N.Y.

"Our company's success in the nuclear medicine product field is the result of its being built on a foundation of lead," Atomic president Pat Miele said. "Virtually everything we produce is either made entirely or partly of lead."

The company's product line ranges from containers used to ship and store nuclear medicine to accessory equipment for gigantic cancer detection scintillation scanners and cameras that can photographically scan the human body from head to toe.

The company's design department has developed a wide variety of lead radiation shielding products.

Saves Weight, Space

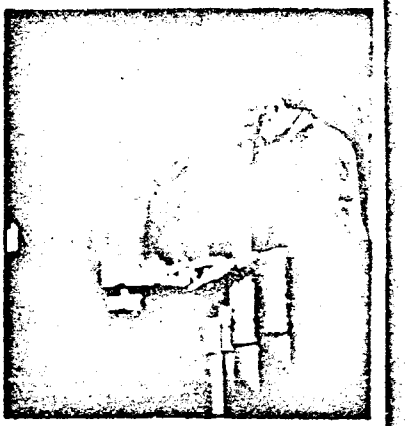
According to Miele, although lead's primary shielding property is mass, its use invariably saves weight and space. He also says the metal's cost and the ease with which it can be cast, extruded, rolled, machined or otherwise formed, combines to make it one of the most efficient and economical shielding materials.

Radiopharmaceutical shields and shipping devices are typical of the products the company casts from lead. To produce the devices, pig lead is melted and poured into round, cylinder-shaped molds with a hollow core. When the lead has cooled and the desired shape of the shield or shipping device has been formed, it is removed from the molds. If required, the sides of the devices are machined and then painted.

Molds also are used to produce the various types of caps that fit over the tops of the devices. Shield devices have lift-off caps while shipping devices usually, pivot for opening.

A typical radioactive shield or shipping device that would be used to ship a radiopharmaceutical is about 9 inches high, has lead walls about 1¼ inch thick, a ¾ inch diameter hollow core, and weighs about two pounds.

In addition to its advantages of being the densest of any commonly available material and being available in a wide variety of forms, lead has another advantage with regard to its use as a radioactive shield material. Because lead does not become contaminated by neutrons or gamma rays, it may be used continuously without fear of its becoming a radioactive source itself by emitting harmful rays, the LIA claimed.



NUCLEAR LEAD — Radioactive isotope shields, being sprayed by workmen, could be lost ceiling items, the Lead Industries Association predicts. Made from cast lead, they are used in medical facilities in conjunction with nuclear devices to detect illness.

NUCLEAR MEDICINE REQUIREMENTS EXPAND USE OF LEAD FOR RADIATION SHIELDING

Initial publication of feature story.... published in Feb. 26, 1973 issue of AMERICAN METAL MARKET

LIA15006

81-2 AMERICAN METAL MARKET [illegible]

MAY 29 1973

Lead Will Tip Quebec's Scales Of Justice in Favor of Silence

MONTREAL — Approximately [illegible] square-feet of sheet lead were employed in the new Province of Quebec Justice Building to ensure that noise from one area of the building would not pass through walls or partitions to adjacent areas.

John Hillenbrand, project coordinator for the partitions contractor, Frank Pakalis, Inc., reported that sheet lead solved most of the critical noise control problems in the building. He remarked that lead is one of the most efficient noise barriers of all common building materials.

Among its areas of employment in the Justice Building were sheet lead barriers used above the tops of partitions and walls, as a component of soundproofing partitions, and as noise barriers in sections of the building's heating and cooling system.

In the latter instance, Hillenbrand pointed out that in high rise buildings, such as the Justice Building, heating and cooling systems are a frequently overlooked channel for noise transmission.

Part of the Justice Building's heating and cooling system, he said, is enclosed in an open sheet metal housing extending around the interior perimeter of the building below the window level. Normally this would be a prime channel for noise to travel the length and breadth of the building and into each room along the way.

However the problem was solved at the Justice Building by installing a series of sheet and lead baffles inside the sheet metal housing at the point where it intersects the partition line, the project coordinator said.

According to the architect, Erwin Chan, prefabricated barriers of steel or gypsum could not have been used because they would have been difficult to fit around the various sizes of piping and ductwork making up the heating and cooling system. In their stead, sheet lead was selected because it could be easily cut with a knife or scissors and was simple to install.

Hillenbrand indicated that sheet lead also played a key role in providing barrier capabilities for a large number of other wall types, ceiling assemblies, and partition supplements. Depending on requirements, either one or two pound sheet lead was used.

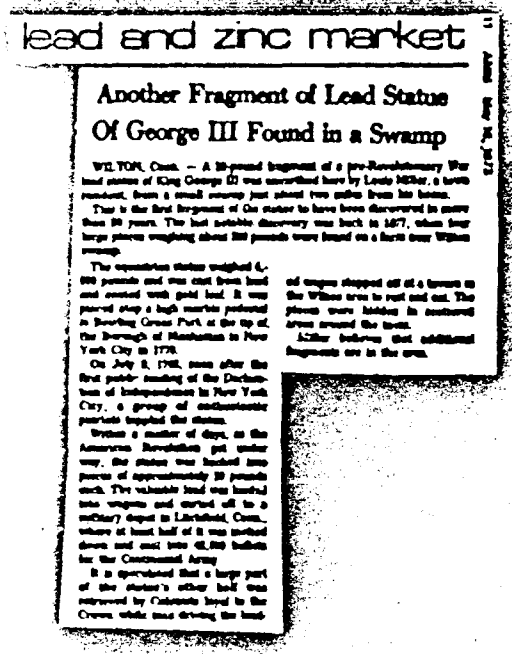
The [illegible] courtrooms in the building he said required sheet lead plenum barriers, each about [illegible] feet high and a total of [illegible] feet long.

In the main court chamber, a large room with sweeping curved walls, the sheet lead plenum barrier installed above the walls was roughly 3 feet high and about 175 feet long.

A CLOSEUP of the heating system at Montreal's Justice Building shows how sheet lead is installed at office partition wall lines to keep noise from traveling between offices.

Initial publication of feature article:
Sheet Lead Used To Control Noise in New Province of Quebec Justice Building in Canada

AMERICAN METAL MARKET — May 29, 1973



lead and zinc market

Another Fragment of Lead Status Of George III Found in a Swamp

WILTON, Conn. — A 36-pound fragment of a pre-Revolutionary War lead statue of King George III was unearthed here by Louis Miller, a town resident, from a small swamp just about two miles from his home.

This is the first fragment of the statue to have been discovered in more than 96 years. The last notable discovery was back in 1877, when four large pieces weighing about 300 pounds were found on a farm near Wilton enough.

The equestrian statue weighed 4,- 000 pounds and was cast from lead and covered with gold leaf. It was placed atop a high marble pedestal in Bowling Green Park at the tip of the Borough of Manhattan in New York City in 1770.

On July 9, 1776, soon after the first public reading of the Declaration of Independence in New York City, a group of enthusiastic patriots toppled the statue.

Within a matter of days, as the American Revolution got under way, the statue was hacked into pieces of approximately 30 pounds each. The valuable lead was hauled into wagons and started off to a military depot in Litchfield, Conn., where at least half of it was melted down and cast into 42,000 bullets for the Continental Army.

It is speculated that a large part of the statue's other half was recovered by Colonists loyal to the Crown while men driving the lead wagons stopped off at a tavern in the Wilton area to rest and eat. The pieces were hidden in scattered areas around the town.

Miller believes that additional fragments are in the area.

Initial publication of feature article:
Lead Fragment of King George III Statue
Destroyed by Revolutionary War Patriots
Is Unearthed
AMERICAN METAL MARKET -- May 10, 1973

AMERICAN METAL MARKET
NEW YORK, N. Y.
D. [illegible]

JUN 6 1973

lead and zinc market

Call for Mass-Produced Soldered Joints Increasing Use of Lead Alloy Preforms

NEW YORK — Rising industrial demand for mass-produced soldered joints has resulted in the increased use of lead alloy preforms, a recent survey by Lead Industries Association showed.

The survey revealed a continuous effort by many industries to either partially or completely automate production lines. This, in turn, has brought about many changes in soldering procedures and techniques, including the solder preform.

Lead alloy solder preforms, the Association said, are manufactured solder configurations containing varying quantities of certain metals alloyed with lead, with or without a flux core. Alloy combinations are available in a wide variety for joining specific metals, it was pointed out.

Lead content in the alloys may range from nearly 100 percent to a low of 30 percent. In most cases the alloy is made with tin.

Among the tin lead alloys listed by the Association, two of the most common are 60 percent tin-40 percent lead soldering alloy used for temperature-sensitive electronic components, and 40-60 tin/lead solder used for automobile radiator cores and roofing seams.

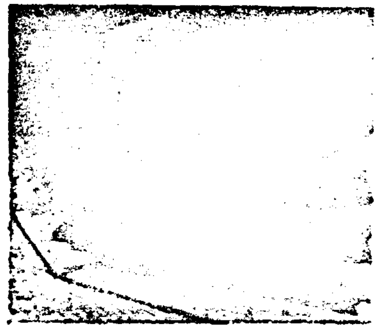
Other types of alloys contain small amounts of silver and no tin. An example of this would be a 97.5 percent lead 2.5 percent silver alloy used for torch heating on copper brass and similar metals. When the material to be soldered is intended for use in humid environments, 1 percent tin is added to the above to eliminate susceptibility to corrosion.

Other alloying elements include copper, gold, antimony, bismuth, cadmium, arsenic, and indium. Such elements in one way or another permit lead to be used to join virtually any metal, the Association stated.

Solder preforms are designed to produce perfect solder fillets for specific joints in an assembly. They can be manually place on the area to be soldered or they can be dispensed automatically by a variety of mechanical devices that are usually custom-designed for a specific solder preform installation.

Once in place, solder preforms can be joined by an conventional heating method compatible with the assembly, including infra-red lamps, induction or resistance heating, natural or propane gas torch, oven or hot plate. Depending on the specific requirement, one or a combination of these heating techniques can be used to make joints with lead alloy solder preforms.

The preforms come in a variety of shapes, each a derivative of one or more of the following four most common forms: wire, punched parts, spheres, or solder-coated metal forms, the Association said.



CHAIR WASHERS, 63 percent tin/37 percent lead alloy, are typical of the solder preforms that have been developed to solve the wide variety of joining problems in the electronics and data processing industries.

Initial publication of feature article:

Use of lead for soldered preforms

AMERICAN METAL MARKET — June 6, 1973

41-71 MACHINE
DESIGN
[illegible]

APR 5 1973

Electronic Defense Against Air Piracy

FBI agents move in with guns drawn on skyjacker of a United 727 jet in Seattle on August 19, 1972. Agent standing on [illegible] is [illegible] aboard the plane. Anti-skyjacking regulations put into effect on January 5 have [illegible] such as this. Photo, UPI.

cursion to Cuba is often a three-day affair. Some 17,000 people have had trips interrupted in the past 10 years. A more serious problem, however, are the casualties among the passengers that result from shoot-outs with authorities. To date, 3 passengers have been killed in the U. S. in duels with skyjackers.

The skyjacker's lot is not a happy one, either. Over 75 skyjackers have fled to Cuba. Because of conditions there, 16 have returned to the U. S. to face prosecution. Two-thirds of those that remain are said to be in jail or under house arrest. Also, four have been killed in gun battles. One was the victim of an apparent suicide.

Keeping Kooks Off

As of January 5 of this year, airlines were required by federal law to screen and/or search every passenger and every piece

Detector finds new job screening passengers at airports. Originally developed to [illegible] broken drill bits left in ore taken from mines, the single-frequency detector establishes an alternating magnetic field between coils in each side of the clamshell housing. The device is preset by the manufacturer to ignore objects that are smaller than weapons. Photo, Harrison & Cooper Associates.

planes. The occasional body search, the presence of Sky Marshals, and metal detectors used prior to 1973 were

[illegible]orts

[illegible]ffective in stopping

[illegible] Costs

[illegible]y has been expensive [illegible] involved, including

[illegible]ace the most obvious [illegible]ses. Last year, ran[illegible] totalled more than $2.5 million of which [illegible] recovered. Other ex[illegible]penses include lost [illegible] operating expenses [illegible]kyjacked plane, in[illegible]surance premiums, in[illegible]terest loans, damaged [illegible] expenses for housing [illegible] during unscheduled [illegible]ports and Cuba. A [illegible]rector for one air[illegible] average out-of-pocket [illegible] about $10,000 for [illegible] a ride to Cuba."

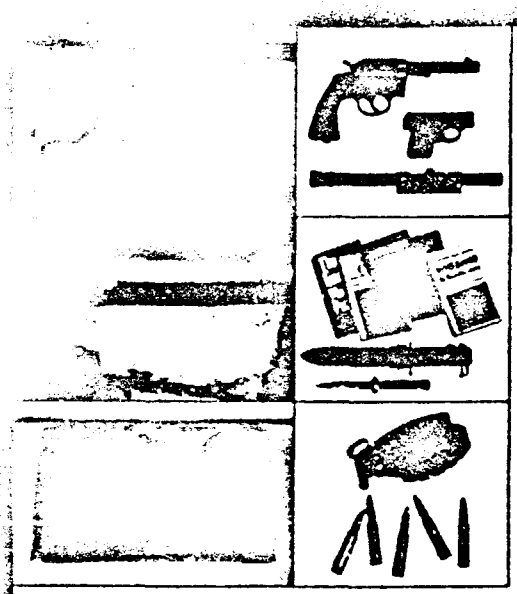
Pilots are occasional victims [illegible]kyjackers. The Airline Pilots Association reports that 150 crew members (pilots, navigators, stewardesses)—or 1 out of 70—were involved in skyjack attempts in 1972. Over the years, six pilots have been shot or stabbed, one was blinded.

The federal government pays, too. Each time a skyjacked plane touches down at a U. S. airport, a swarm of FBI agents descends on the plane. The greater the number of stops, the more agents are involved. Recently, the FBI has begun following commandeered planes in a chase plane, obviously increasing the cost of surveillance.

Also, the FAA's celebrated corps of Sky Marshals (1,200 to 1,300 strong) has been placed on ground duty at airports around the country to help prevent pirates from boarding aircraft.

The public suffers much in the way of inconvenience. An ex-

LIA15010



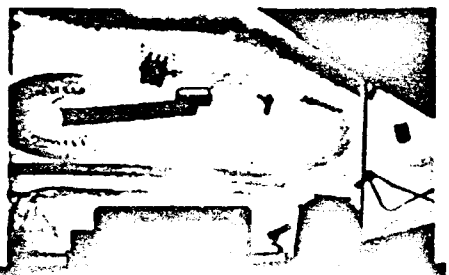
X-ray fluoroscope "looks" into carry-on luggage, flats, letters, and grounds, concealed in packages, show up clearly on fluorescent screen. Photo, Philips Electronic Instruments.

guishes between small and large objects by generating two fields —one at a high frequency, the other at a low frequency. Disturbances within the field are analyzed by data-processing circuitry to determine if the object in large enough to be a weapon.

Processing time for passengers has been improved with the newer, walk-through models. Passengers are rarely delayed for more than three minutes during inspection.

X-ray fluoroscope equipment is used to check carry-on bag-

Bomb-triggering device, buried with a shaving kit in a suitcase, is unmasked by X-ray equipment. Although X-ray systems are not required by new FAA screening regulations, they're being tried by several airlines because they can speed package examination. Photo, Philips Electronic Instruments.



SKYJACKING

gage in airports around the country. This system is mounted in a lead-lined enclosure to prevent radiation leakage. At the enclosure surface, radiation level is said to be about the same as that emitted from a color TV set. Typical maximum package size is 24 x 18 x 24 in.; maximum weight is 100 lb.

One system, built by Philips Electronic Instruments, Mount Vernon, N. Y., uses an X-ray-generating unit that is adjustable from 30 to 130 kV, depending on the "penetrating power" required. This system projects the X-ray image of the package to a mirror so that the primary radiation will not be reflected to the viewing part. An operator views the image at the part on a sheet of leaded glass 0.25 in. thick. Resolution on the glass is 3 line-pairs/mm. Operating speed is estimated to be as high as 4,800 packages per day, or 15 sec per package.

Price for X-ray equipment runs about $30,000 to $35,000. This expense must be borne by the airlines because the FAA does not specifically require that X-ray equipment be used. It simply states that carry-on luggage must be inspected, and the airlines seem to be of a consensus that X-raying the packages is the fastest way of doing the job.

Do Screening Measures Work?

Since July, 1972, when tough boarding procedures were first put into effect, skyjackings dropped from an average of four per month to less than one per month, according to FAA figures. Since the even stricter measures were put into effect on January 5 this year, two at-

AIRPORT ANTI-SKYJACK X-RAY DEVICE SHIELDED BY LEAD

Feature article released by LIA used as basis for expanded feature published in MACHINE DESIGN April, 1973

One of three feature placements

41-8X SECONDARY
RAW MATERIALS
NO. 1,100

MAR 1973 CLIPPED BY BACON'S

With Lead in Gas Being Threatened Industry Is Looking for New Uses

With the possibility of lead being removed from gasoline, industry officials are desperately looking for other applications to take up the slack.

One such new application could be lead shielding used for X-Ray airport baggage inspection systems.

Like nuclear medicine, airport inspection systems will require lead for safety units, the Lead Industries Association claimed. However no specific consumption predictions were given by the group.

A LIA spokesman told this newspaper that nuclear medicine and airport baggage inspection systems, "of course won't consume as much lead" as currently used in gasoline, "but these new applications really could help in taking up the slack."

The inspection system being tested by the LIA allows airport officials to view the contents of carry-on airline luggage or packages without opening them.

The system, called Dynafluor and manufactured by Torr-X-Ray Corp., Los Angeles, has been "successfully" tested by Western Airlines and Pacific Air West Airlines at Los Angeles International Airport, and by Delta Airlines at New York's Kennedy International Airport, according to an LIA spokesman.

Also, the federal government has reportedly bought 34 of the systems which are exclusively distributed by Electronic Instruments, Mount Vernon, N.Y.

Using an X-Ray, the system produces visible images of the contents of luggage or a package. The images, which are viewed on a screen seen through a specially designed porthole, are similar to those seen in a three-dimensional photograph negative.

The images consist of shadows of varying density and a specially trained operator can detect weapons and explosives by their shape.

Despite its advantages, the new airline security device has one potential hazard — excessive radiation.

Therefore, the manufacturers had to build an effective radiation shield using sheet lead.

The unit's entire X-Ray generator system is completely enclosed in 3/32 of an inch thick lead, except for the X-ray tube slit which directs the beam. The lead sheets weigh roughly 10 pounds per square foot.

Lead also plays a critical role in the unit's fluoroscopic viewing system. Indirect viewing of the screen is accomplished by use of a mirror so that primary radiation from the X-ray tube will not strike the viewing port. To insure complete shielding from any secondary radiation, the viewing port consists of 1/4-inch thick leaded glass.

Delta Airlines held a recent three-week test of a Dynafluor unit at its Kennedy International Airport terminal.

In addition to determining if the system would be effective in the inspection of all baggage to be carried aboard airliners, Delta also wanted to see how quickly the equipment could function.

According to Gary Moore, Delta Airlines station manager at Kennedy International Airport, the test was highly successful from the standpoint of its capability of rapidly and efficiently providing a visual inspection of all hand baggage.

Delta estimates that widespread use of an X-ray fluoroscopic unit throughout its system would reduce from minutes to seconds the time required to process an individual's carry-on baggage.

For example, it could take as long as five man-hours to manually inspect carry-on luggage of passengers preparing to board a jumbo jet.

Tests conducted by Western Airlines and Pacific Air West Airlines at Los Angeles International Airport have determined that with the new X-ray system, the average bag inspection takes about 10 seconds, indicating that relatively little delay is encountered by boarding passengers.

Other Tests

In the meantime, the new detection system is being used for other purposes. The U.S. Air Force is using it to check incoming overseas mail, packages and baggage for contraband such as illegal weapons and narcotics.

A number of religious organizations and agencies that directly or indirectly represent foreign governments are using the equipment to screen incoming mail and packages that might contain explosives mailed by terrorist organizations.

SECONDARY RAW MATERIALS, March

AIRPORT ANTI-SKYJACK X-RAY DEVICE SHIELDED BY LEAD

Feature article published in SECONDARY RAW MATERIALS -- March, 1973

One of three feature placements

LIA15012

75-41 ELECTROMECHANICAL DESIGN
APR 1973

X-RAY DEVICE SPOT CONTRABAND

lead shielding prevents bomb detonation

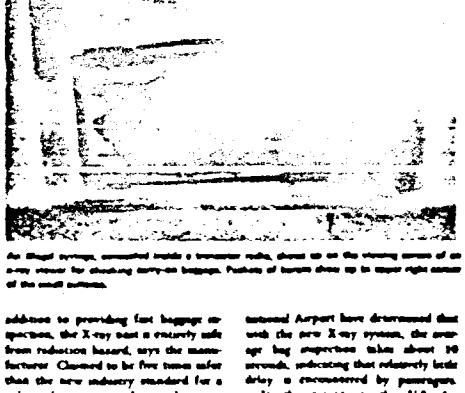
Preventing hijacking and increasing airline passenger security has forced designers to develop a wide array of measures that detect concealment. Familiar now to most air travelers, magnetometers and security guards of late have the entrances of airport departure terminals. But despite these apparent improvements in security, departing passengers are subject to a great deal of delay while their carry-on baggage is searched.

Confronted with this problem, engineers at the Torr X-Ray Corp., Los Angeles, designed a fluoroscopic surveillance system called Dynaflour. In addition to providing fast baggage inspections, the X-ray unit is entirely safe from radiation hazard, says the manufacturer. Cleared to be five times safer than the new industry standard for a color television set, the unit's entire X-ray generator system is completely enclosed in 1/12" thick, 10 lbs/sq ft lead, except for the X-ray tube slot which directs the beam.

Lead also plays a critical role in the unit's fluoroscopic viewing system. Designers accomplished indirect viewing of the screen with a mirror, so that primary radiation from the X-ray tube does not strike the viewing port. To insure complete shielding from any secondary radiation, the viewing port contains of 1/4" thick leaded glass.

Delta Airlines began a three-week test of a Dynaflour unit at its Kennedy International Airport terminal in mid-December of last year. In addition to determining if the system would be effective in the inspection of all baggage to be carried aboard airliners, Delta also wanted to see how quickly the equipment could function.

Delta estimates that widespread use of X-ray fluoroscopic units throughout its system would redirect from minutes to seconds the time required to process an individual's carry-on baggage. For example, it could take as long as five man-hours to manually inspect carry-on luggage of passengers preparing to board a jumbo jet. Tests conducted by Western Airlines and Pacific Air West Airlines at Los Angeles Inter-



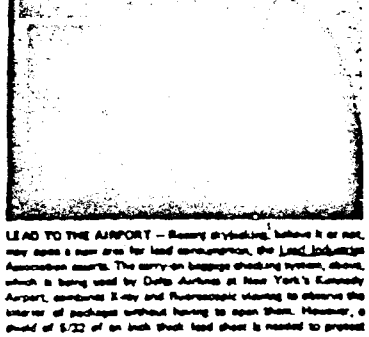
An illegal syringe, concealed inside a transistor radio, shows up on the viewing screen of an x-ray viewer for checking carry-on baggage. Portions of human bones show up in upper right corner of the small suitcase.

national Airport have determined that with the new X-ray system, the average bag inspection takes about 10 seconds, indicating that relatively little delay is encountered by passengers.

In the meantime, the U.S. Air Force is using the new detection system to check incoming overseas mail, packages and baggage for concealed such as illegal weapons and narcotics. A number of religious organizations and agencies that directly or indirectly represent foreign governments are also using the equipment to screen incoming mail and packages that might contain explosives mailed by terrorist organizations.

APRIL 1973

S-2 AMERICAN METAL MARKET
MAR 12 1973



LEAD TO THE AIRPORT – Beauty or shielding, believe it or not, may open a new era for lead consumption, the Lead Industries Association asserts. The carry-on baggage shielding system, above, which is being used by Delta Airlines at New York's Kennedy Airport, combines X-ray and fluoroscopic viewing to observe the interior of packages without having to open them. However, a shield of 1/32 of an inch thick lead sheet is needed to protect people from radiation.

AIRPORT ANTI-SKYJACK X-RAY DEVICE SHIELDED BY LEAD

Feature article published in ELECTROMECHANICAL DESIGN -- April, 1973

One of three feature placement

Photo caption release -- AMERICAN METAL MARKET

LIA15013

MAY 21 1973

Feature article: Battery-Powered Pleasure Boat Introduced

Published in: DESIGN NEWS

May, 1973

Design *NEWS*

Battery-powered Boat is Pollution-free

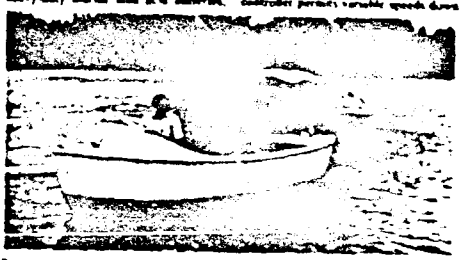
—Port Salerno, FL—Lead-acid batteries are helping to put "pleasure" back in boating. They're being used to power an 18-ft-long boat that is made by the Bronson Boat Co.

Called the "Electra 18", the battery-powered boat was designed to solve two of the major problems facing the rapidly expanding pleasure boat industry: noise pollution and oil residue pollution.

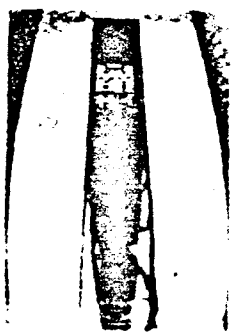
Although it was designed for trolling, the boat is also gaining acceptance for leisurely sightseeing, picnicking and cruising in light traffic waters, according to Bronson.

The Electra is powered by two heavy-duty marine lead acid batteries, each delivering 272 amps/hr at 24V and installed in a keel box. The keel box also contains the boat's electric motor and an automatic bilge pump that prevents the motor from flooding due to excessive rain-water. The total weight of the boat, including the keel box and its equipment is 1,300 lb. Since the weight is at the craft's centerline, the boat is unusually stable.

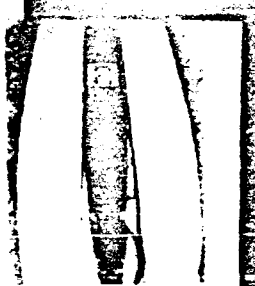
The inboard power system for the craft, a permanent magnet electric motor that delivers 3/4 hp, can run the boat for about 90 miles at 5 mph cruising speed. At 3 mph, the boat can be operated for 12 hours. A solid state controller permits variable speeds down



Battery powered Electra ... with 5 1/2 ft beam and 1 ft draft, a stable boat for leisurely cruising



This heavy-duty marine batteries (272 amp at 24V) drive motor mounted in keel box to give maximum speed of 5 mph and range of 90 miles without recharging



In addition to being designed to provide optimum stability, the hull and keel also provide protection for the boat's heavy duty propeller and rudder. The craft has a 5½' beam and a draft of only one foot, making it especially useful for shoreline exploring.

Company President Bronson reports that work is in progress for a model to produce a 30' fiberglass electric boat. He says the boat will be known as the "Electra 30" and it will have an 8' beam and a draft of 18". The boat will have a total displacement of between 5 to 6 thousand pounds depending on the number of people aboard.

The battery capacity of the Electra 18 will be over 30 kilowatt hours and the boat's maximum speed will be about 6 knots. At a speed of 5 knots, the boat is expected to run for more than 12 hours for a total distance of about 60 nautical miles before recharging.

THE BATTERY MAN, June, 1973

BATTERIES HELP ELIMINATE NOISE AND POLLUTION OF WATERWAYS

"Pleasure" gets put back in pleasure boating. . .

Lead acid batteries are helping to put pleasure back in pleasure boating. They are being used to power an 18-foot long boat that is being produced by the Bronson Boat Company, Port Salerno, Fla.

Appropriately 18," the boat designed to sol problems facing pleasure boat commuters an pollution from engines used to boats, and the p residue entrained i

"A lot of wate outlawing stan Conservationists pressing hard prohibiting most waterways by engine craft. On elsewhere these

Norman Bronson, president of the boat company.

Designed for trolling, the boat is also gaining acceptance for leisurely sightseeing, picnicking and cruising in light

boat for about 90 miles at 5 miles per hour cruising speed. At 3 miles per hour, the boat can be operated for 12 hours. A solid state controller permits variable speeds down to below 1 mph.

automotive marine amps any 115 volt can so recharge the e comes. A warning overcharge the batteries will according to the

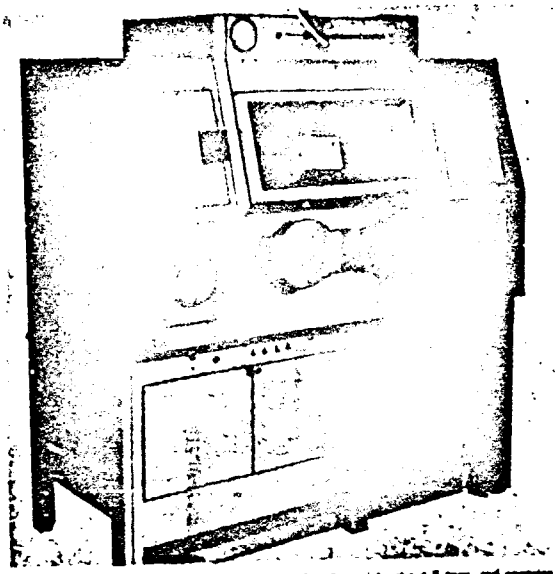
Feature article: Battery-Powered Pleasure Boat Introduced

Published in: THE BATTERY MAN

June, 1973

LIA15014

metals for nuclear energy section



SINGLE STATION GLOVE BOX has stainless lead walls, weighs about 5 tons, and contains leaded glass ports in the front and ends. Technicians use glove boxes to transfer radioactive pharmaceutical materials from one device to another.

Growing Atomic Energy Use Spurs Lead Shielding Demand

By PHILIP E. ROBINSON

NEW YORK — With fossil fuels and natural gas increasing scarce, all signs point to a burgeoning demand for atomic energy. In addition to the 39 nuclear plants now in operation in the United States, 56 plants are being built and 77 are on order. According to a recent United States Atomic Energy Commission estimate, by the year 2,000, 50.1 per cent of the nation's electric power will be generated by nuclear energy, as compared to only 4 per cent today.

Nuclear powered ships, common in the U.S. Navy today, are expected to be commonplace in the U.S. merchant fleet as well. The Navy's atomic powered fleet now includes nearly 80 cruisers, aircraft carriers, destroyers and submarines. Projected plans call for a nuclear powered carrier every third year and five to seven submarines and a guided missile destroyer each year. The energy crisis, coupled with the high fossil fuel cost, has caused a renewed interest on the behalf of both government and private industry in building nuclear powered merchant ships.

Mr. Robinson is executive vice-president of the Lead Industries Association, Inc., New York City.

Nuclear energy is by no means restricted to electric power plants and ship propulsion systems. For example, years of research have resulted in great advances in radiochemistry, to the point where a whole new industry is developing to serve that field of science and medicine. Radioisotopes and radiopharmaceuticals are used to detect and treat cancer, cobalt therapy to save and prolong many lives threatened by the disease.

All these factors give strong evidence that the use of lead in the nuclear industry will increase in the immediate future.

The harnessing of atomic energy brought with it the problem of controlling the powerful rays emitted during atomic disintegration. Basically, the problem of protection from these rays is the same as from X-rays. Lead as a shielding agent has played a historical role in the area since the discovery of X-rays in 1895.

The Favored Material

Lead is clearly the favored

AMERICAN METAL MARKET

SPECIAL SUPPLEMENT:

"METALS FOR NUCLEAR ENERGY"

Special feature article by:

Philip E. Robinson

(Page One)

23

Growing Atomic Energy Use Spurs Lead Shielding

(Continued from page 2A)

shielding material in a variety of applications where space is at a premium, such as on a ship, where mobility is important, such as shipping casks for nuclear materials and wastes, where weight is a significant factor, such as where shipping containers, doors, etc., are concerned, or where flexibility of design is required, such as lead brick walls.

In fact, lead is so efficient as a shield material that it is almost always the first material to be considered when designing shielding against X-rays or gamma rays, the two most common types of radiation encountered. It is because of this that the Atomic Energy Commission has stated that when other shield materials are considered, "Comparisons are usually expressed in terms of lead because it represents the best practical gamma shield for most applications."

Although lead's primary shielding property is density, its use often saves weight and space, too. Lead's low cost and the ease with which it can be cast, extruded, rolled, machined or otherwise formed combine to make it one of the most efficient and economical shielding materials.

It is difficult to pinpoint the specific market potential for lead in nuclear power construction because a standard nuclear power plant has yet to be developed. Atomic power plants now on stream, under construction and awaiting approval each have different lead requirements because of the difference in design.

Some Big Users

For example, some reactors are designed to use a chute for transferring depleted fuel elements from the reactor to a storage area. The Yankee power plant at Rowe, Mass., required approximately [illegible] access door in the Indian Point reactor containment sphere required 75 tons of lead, and another 76 tons of lead was required to shield the door frame.

The Elk River reactor in Minnesota, a boiling water reactor (BWR), has a 30-ton lead gamma shield. Its purpose is to absorb much of the gamma radiation from the reactor before it reaches the concrete shielding. Other reactors of this type have been built at Sioux Falls, S.D., and near Pasadena, Calif.

Fuel transfer casks are used by many reactors so that fuel elements can be shifted during burn-up and removed once they are depleted. The Hallam Nuclear Power facility in Nebraska has a transfer cask that required 135 tons of lead. A transfer cask for an experimental sodium reactor required 45 tons of lead, while a cask to contain a radioactive reactor control rod can require as much as 35 tons of lead. Hundreds of such casks will be required as more nuclear power plants are added.

Classified Data

Nuclear powered U.S. Navy surface and subsurface ships are known to require vast amounts of lead, but the specific amount of such lead, where it is used, and how it is installed is classified information. What is known is that the use of lead in Navy ship construction will continue to expand. In recent years, the U.S. Navy has placed increased emphasis on both surface and subsurface atomic ship construction.

The Navy would like to launch a massive ten-year, [illegible]-billion shipbuilding program to modernize its fleet. The plan is reported to include a nuclear-powered carrier every third year, and five to seven submarines and a guided missile destroyer each year. This would, of course, represent a huge market for lead . . . and the decision to begin the Navy's massive nuclear-powered shipbuilding may come sooner than expected due to the worldwide shortage of oil.

The oil crisis, and again the high cost of fossil fuel, is also resulting in a revival of plans for atomic powered merchant ships. Something of what this can mean can be seen in the lead requirements for the first nuclear-powered shipbuilding may come sooner than expected due to the worldwide shortage of oil.

The oil crisis, and again the high cost of fossil fuel, is also resulting in a revival of plans for atomic powered merchant ships. Something of what this can mean can be seen in the lead requirements for the first nuclear-powered merchant ship, the Savannah. About 500 tons of bulkhead shielding was required for the Savannah. About 500 tons of bulkhead shielding was required in the Savannah, and at least 3,000 pounds of lead was required for other applications. While it is not known just how much lead they will require, nuclear-powered merchant ships now planned will be three times more powerful than the Savannah.

Reactors Increasing

Research and test reactors are increasing in size and number, and they have their own lead requirements. The plutonium recycle test reactor required a 50-ton refueling machine, the Georgia Tech research reactor required a 35-ton gamma and thermal shield, and a similar installation was required by the National Bureau of Standards' reactor. The Westinghouse testing reactor required 35 tons of lead shot while the General Electric nuclear facility at Evendale, Ohio, chose 30 tons of lead brick because of its flexibility.

Cancer treatment and detection is one of the most rapidly expanding fields of medicine. This expansion is, in turn, creating expanding markets for lead. For example, there are 1,500 hospitals throughout the country that have radioisotope facilities, and each facility has a wide variety of radiation shielding applications that require lead.

Foremost in tonnage is the lead shielding which surrounds the equipment itself. Included are such devices as artery and bone irradiators. They use as much as seven tons of lead and there are about 1,000 such installations throughout the country.

There are nearly as many cobalt teletherapy irradiators and they require up to 10 tons of lead shielding.

Radioisotope storage and radiopharmaceutical shields and shipping devices are required by the thousands. A typical radioisotope shield or shipping device is about 5 in. high, has lead walls about 1½ in. thick and a ½ in. hollow core to store the radiopharmaceutical, and weighs about 2 pounds.

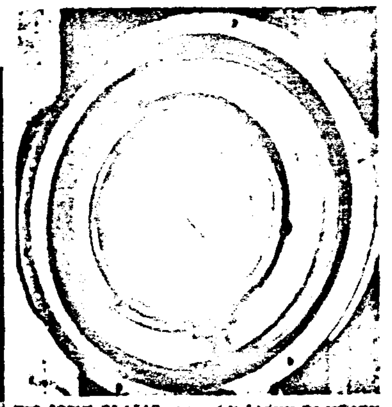
The radiopharmaceuticals may be stored in safes that have 6 in.-thick lead walls and weigh several tons. Special radiation-proof glove boxes which are used to transport radiopharmaceutical materials from one device to another weigh as much as 2 tons.

Lead, being an extremely stable material, does not become radioactive under bombardment by neutrons. An additional favorable factor in using lead shielding, therefore, is its reuse or scrap value. It also is important to note that reclaimed lead accounts for 1/3 of the U.S. consumption, much of which is used for shielding material.

When lead brick or sheet is used for shielding X-rays or gamma rays, its density is all that counts. The slight lowering of density by alloying or by impurities is of little consequence. Readily available commercial lead is suitable since it can be obtained in purities up to 99.99 percent, whereas a 99.5 percent purity is considered acceptable for this application.

TYPES OF LEAD USED FOR RADIATION SHIELDING

Form	Use
Lead Sheet, Slab, and Plate	Permanent shield installations
Lead Shot	Where solid lead is impractical, due to location, shape, and accessibility
Lead Wool	Filling deep cracks in a radiation barrier
Lead Epoxy	In-the-field crack filling and patching
Lead Putty	Non-hardening, temporary and or patch
Lead Brick	Convenient, easily handled, may be moved and re-used
Lead Pipe	Shielding of Radioactive liquids
Lead-clad Tubing	Shielding of radioactive liquids
Lead-lined/Lead-clad Pipe	Shielding of radioactive liquids
Lead Sleeves	Shielding of ducts and pipes carrying radioactive materials
Lead Powder	Dispersed in rubber or plastic for [illegible] shielding, also mixed [illegible] concrete and asbestos cement [illegible] Shielding [illegible] gamma, neutron, and [illegible] neutron barrier material



TWO FORMS OF LEAD were used to fabricate the collimator seen mounted in the center of a radiography camera, which is used for head-to-toe cancer detection scanning.

AMERICAN METAL MARKET

SPECIAL SUPPLEMENT:

"METALS FOR NUCLEAR ENERGY"

Special feature article by:

Philip E. Robinson

(Page Two)

American PAINT JOURNAL
Monday, April 9, 1973

Chrome Yellow In Spotlight

Pavement Marking Program Hinges on Legislation

CHROME YELLOW PAINT will play a major role in two key highway pavement-marking programs of a proposed nationwide, Federally-funded highway safety project. The programs were developed to help decrease the 14.6 million vehicular traffic accidents that resulted in 56 thousand deaths, two million disabling injuries and more than $15 billion in property damage in the United States in 1971 and 1972.

The nationwide highway safety project would result from the Highway Safety Act of 1973, which is expected to be passed by this Congress. The pavement-marking programs, which will cost $330 million, are considered of priority from among the more than a dozen highway safety programs to be authorized by the Act. Two-thirds of the billion-dollar annual cost of the highway safety program would come from the Highway Trust Fund, which is financed by federal taxes on the sale of all gasoline and truck highway uses and can now only be used for new highway construction.

The first project authorized would be a special pavement marking program. For the first time, it will meet the critical need to provide sufficient actual funds to thoroughly mark the rural two-lane roads where two-thirds of the nation's highway fatalities occur.

The second project would be a pavement-marking research and demonstration program to determine effectiveness of types of pavement markings under inclement weather and night time conditions.

Solid, broken and dotted single and double center line markings are the most frequently used to prevent traffic accidents. They indicate "passing," "no passing," and "passing-with-caution" zones and, even though they are known as center line markings, they are not always in the geographic center of pavements. Solid line pavement markings also are used to mark the pavement edge of streets and highways where there is inadequate clear space to the left of the line even for disabled vehicles or for making emergency stops.

These types of pavement markings and others such as curb markings and transverse lines to indicate highway instructions are painted "highway yellow," a special color standard that has been specified for all cautionary highway traffic control devices, including signs. Lead Industries Association, Inc., New York, says the prime paint pigment that most readily meets the standard color requirement, as well as cost requirements, is lead chromate or "chrome yellow."

—continued

The association also says it has good resistance to degradation by light and resists chemicals used to remove snow and ice from pavements. In most cases, reflectorized chrome yellow paint will be used for the pavement markings, since this helps improve night time visibility.

The $300 million which the Act will allocate for the nationwide highway pavement marking program cannot be fully appreciated until one is aware of the critical need for such a program, an association spokesman says. Simply stated, it will provide, for the first time, funding to mark in accordance with the 1971 Manual on Uniform Traffic Control Devices for Streets and Highways (known as the UTCD) those roads included in the Federal aid primary and secondary highway system, as well as those roads which are not.

A revised, updated and expanded version of the 1961 manual it supersedes, the 1971 edition is published by the U.S. Department of Transportation, Federal Highway Administration, and was developed with the cooperation of the National Joint Committee of Uniform Traffic Devices. The end result of efforts that began in 1867 to develop a uniform standard for traffic control devices, the 1971 Manual is intended to serve as the regulatory directive for all streets and highways in the United States.

There is, however, a major problem in implementing the provisions of the new manual on a nationwide basis until the new law is passed.

Of the nearly 4,000,000 miles of paved streets and highways in the United States only 900,000 miles of interstate, state and county and municipal primary and secondary roads are built with Federal aid funds.

In qualifying for Federal aid funds to build such highways, states had to agree to maintain them after they were built. They had to do so in accordance with instructions and regulations established by the UTCD Manual. Hard pressed for funds needed to comply even with the 1961 edition of the manual, the states found it virtually impossible to comply with the greatly expanded requirements for the increased use of traffic control devices outlined in the 1971 manual. In particular, they lacked the funds to provide the paint, men and equipment needed to comply with the new requirements.

For example, the New York State Highway Department expects to use about 300,000 gallons of highway yellow paint this fiscal year when it begins implementing the provisions of the new manual. The department estimates it will require an additional 122,000 gallons of highway yellow paint to fully comply with the new manual during the 1973 fiscal year. Based on the fact that it takes about 17 gallons of paint to paint one mile of 4-inch to 6-inch wide normal width pavement marking, the state expects to have to paint approximately 20,000 miles of additional yellow pavement marking to comply with the new manual.

Many municipal and county officials responsible for maintaining the nearly 3,000,000 miles of paved rural and urban primary and secondary highways that were not built with Federal aid funds find it difficult, if not impossible, to comply with the guidelines published in the new manual.

With the $300 million being sought in the Highway Act of 1973, it is expected that all states and counties in the United States will have sufficient money to provide the paint, men and equipment required to mark principal highways under their jurisdiction. The funding also will permit surveys to determine where pavement markings are needed in order to comply with the 1971 UTCD Manual.

It is estimated that 800,000 miles of two-lane roads will receive yellow centerline markings and that approximately 800,000 miles of edgelines will be placed on primary and secondary county and township routes at a cost of $120 million.

The Act also directs states to submit annual reports on the results of the effectiveness of the Act's two pavement marking programs to the Secretary of the Interior. He will, in turn, report the results to Congress. If the pavement marking programs provide the expected decrease in highway accidents, it is likely that permanent funding for pavement markings will be provided by the states. This would be particularly important since highway pavement markings only last from one to three years depending on the amount of traffic, the width of the road, weather conditions, etc.

In addition to the $30 million proposed for the pavement marking research and demonstration program in the Highway Safety Act of 1973, other major programs likely to be authorized which involve the extensive use of chrome yellow paint would include: spot improvement projects for high hazard locations, $300 million; a program to eliminate roadside obstacles, $130 million; a special highway safety research and development program, $225 million; and other highway safety programs, $430 million.

Feature Article:

CHROME YELLOW PAINT TO AID NATION IN DECREASING AUTO ACCIDENTS

NOTE: This is the fourth feature article to be published on chrome yellow highway paint.

LIA15017

Battery Powered Bus Publicity released during and immediately after Annual Lead Industries Association, Inc. Meeting in Detroit

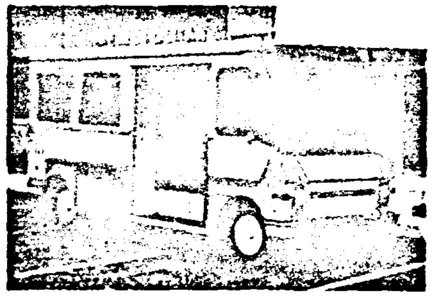
Published in AMERICAN METAL MARKET, THE NORTHERN MINER, MACHINE DESIGN

41-77 MACHINE DESIGN
S.O.M. 134,800

MAY 31 1973 (CLIPPED BY BACON'S)

NEWS TRENDS

Electric Bus Features Quick-Change Batteries



Battery-powered shuttle bus now operating in Cleveland is heralded by the Lead Industries Association Inc. as one "answer to some of the major intra-city transportation problems that might result from promulgation of vehicular restriction laws passed by various metropolitan authorities." The laws referred to are those which would prohibit internal-combustion vehicles in some sections of a city to cut down on air pollution.

The bus carries 25 passengers and is operated by Cleveland Electric Illuminating Co. to transport employees from the company's headquarters to a service center. The bus makes eight round trips daily on runs that are approximately 2 miles long. It is one of the first electric-powered mini-buses to be in permanent use in the U.S.

Designed and manufactured by Battronic Truck Corp., Boyertown, Pa., the new bus has a top speed of 25 mph—well suited to city speed limits—and a maximum range of 40 miles before the batteries have to be recharged or changed. A self-contained battery system permits removal and replacement of the lead-acid battery power package in less than 5 min—the vehicle does not have to be tied to a battery charger for long periods or taken out of service while batteries are changed.

84.71 THE NORTHERN MINER
WKLY 30,800

APR 12 1973 (CLIPPED BY BACON'S)

51.2 AMERICAN METAL MARKET
DLY. EX. SAT., SUN. AND HOLIDAYS 23,000

MAY 15 1973 (CLIPPED BY BACON'S)

A Cleveland Firm's Intro-Plant Bus Is Powered by a Lead-Acid Battery

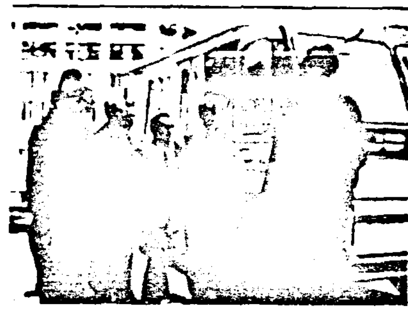
NEW YORK — A lead-acid battery-powered bus may be one answer to strict United States government requirements for efficient control of automotive pollution emissions, the Lead Industries Association claimed.

One lead-acid battery bus, designed and manufactured by Battronic Truck Corp., Boyertown, Pa., is being employed by the Cleveland Electric Illuminating Co. to transport employes between the company's headquarters and service center.

The 25-passenger bus has a top speed of 25 miles an hour, and a maximum battery range of 40 miles.

A self-contained battery system developed by Battronic permits removal and replacement of the lead-acid battery power cell in less than 5 minutes.

This means that the vehicle does not have to be tied to a battery charger for long periods or taken out of service while the batteries are recharged.



ELECTRIC VEHICLE: Powered by lead acid batteries, a bus ... vehicle was on demonstration at the LIA and ZI annual meetings in Detroit.

Test run for a new lead consumer

Above are some of the nearly 300 officials representing North American and foreign companies who attended the 3-day combined annual meetings of the Lead Industries Association and the Zinc Institute held in Detroit on Apr. 4-6 who prepare to board an electric bus for a short tour of downtown Detroit.

Supplied by the Cleveland Electric Illuminating Co., which is testing it, and the Battronic Corp., manufacturers, the vehicle demonstrates the role lead acid batteries are playing in developing non-polluting passenger systems for intra-city shopping centre, airport and other types of shuttle service.

Visible from left to right are R. L. Stubbs, ... and Development Association, London, England; E. R. Gautschi, Cominco Ltd., Vancouver, Canada; R. E. Wallace, Homestake Mining Co., San Francisco, Calif.; P. E. Robinson, Executive Vice President of the Lead Industries Association, Inc. ... the Zinc Institute, New York, N.Y.; R. P. Reeves, Cominco American Inc., Spokane, Wash.; Robert De..., Battronic Corp., who represented the manufacturer of the electric bus; and H. J. Whitson, NL Industries, Hightstown, N.J.

LIA15018

AMERICAN PAINT JOURNAL
April 23, 1973

Lead Industries Association Names Mardick, Ramsey New Directors

Detroit, April 18 — J. A. Mardick, vice president, Metals Division, N L Industries, and R. H. Ramsey, vice president, Newmont Mining Corp., both of New York, were added as new members of the board of directors of Lead Industries Association, Inc., at its recent meeting here.

Other directors re-elected at the 45th Annual Meeting of the Association were: D. B. Craig, St. Joe Minerals Corp., New York; J. G. McCullough, Amax Lead & Zinc Inc., Clayton, Mo.; S. D. Strauss, American Smelting & Refining Co., New York; F. H. Osborn, Broken Hill Associated Smelters Proprietary Ltd., Melbourne, Australia; J. C. MacLeod, Cominco American Inc., Spokane, Wash.; H. T. Fargey, Cominco Ltd., Vancouver; L. M. Norman, Dresser Industries Inc., Houston; R. O. Brandis, E. I. du Pont de Nemours & Co., Wilmington, Del.; R. J. Kenny, [illegible] Inc., Philadelphia; R. A. Kendal, American Smelting & Refining Co., New York; R. A. Gardner, Jr., Gardner Metal Co., Chicago; R. H. Ramsey, Newmont Mining Corp., New York; W. H. Love, Hecla Mining Co., Wallace, Ida.; P. C. [illegible], Homestake Lead Company of Missouri, San Francisco; J. A. Mardick, N L Industries, Inc., Hightstown, N.J.; E. C. Hendrick, Noranda Sales Corp., Ltd., Toronto; H. A. Krueger, Ozark Lead Co., Sweetwater, Mo.; R. Vimer, Hyman Viener & Sons, Richmond, Va.; and T. M. Smythe, Ethyl Corp., Baton Rouge, La.

D. B. Craig, executive vice president, St. Joe Minerals Corp., New York, was re-elected president and chairman of the board of directors.

T. M. Smythe, Ethyl Corp., Baton Rouge; J. F. Rittenhouse, Exide Corp., Plymouth Meeting, Pa.; and J. G. McCullough, Amax Lead & Zinc Inc., Clayton, Mo., were re-elected vice presidents of the association.

L. E. Gage, director of communications, was elected to the additional post of assistant secretary.

Other officers re-elected were: P. K. Robinson, executive vice president; J. F. Smith, secretary and general manager; R. J. O'Hara, Amax Lead & Zinc, Inc., treasurer; and Mrs. D. L. Moore, comptroller and assistant treasurer.

April 23, 1973

IRON AGE METALWORKING INTERNATIONAL
PHILADELPHIA, PA.
MONTHLY [illegible]

FEB 1973

Please excuse the delay in the mailing of this clipping to you. The publication from which it was taken was late in arriving in our office.

[illegible]

Annual Meeting—Lead Industries Association—4-6 April, Detroit. Agent: Lead Industries Association, 292 Madison Ave., New York, New York 10017.

National Fluid Power Association Spring Meeting—8-11 April, [illegible], Florida. Agent: NFPA, P.O. Box 49, Thiensville, Wisconsin [illegible].

[illegible] National Open Hearth & Basic Oxygen Steel Conference & [illegible] Ironmaking Conference—9-11 April, Cleveland. Agent: The Metallurgical Society of AIME, 345 East 47th Street, New York, New York 10017.

41-71 WASTE TRADE JOURNAL
WKLY.

MAR 24 1973

Lead Industries Association, Zinc Institute to Hold Joint Annual Meeting April 4-6

The Lead Industries Association, Inc. (LIA) and the Zinc Institute, Inc. (ZI) will hold their Annual Joint Meeting at the Sheraton-Cadillac Hotel, Detroit on April 4-6. The meeting will mark the 45th for the LIA and the 55th for ZI.

Attendance at the two meetings will be primarily confined to members of the two associations and members of closely related trade associations whose members are consumers of the two metals. Foreign and domestic government officials as well as members of the press will be invited to the meetings.

The Annual LIA Meeting is scheduled to begin on the afternoon of April 4 with a business session to nominate and elect the Association's Board of Directors and to hear the Treasurer's report. Later in the afternoon, there will be a report on the status of lead in gasoline and a panel from the auto industry will discuss the future use of such lead-containing products as batteries, solders and paints in automobiles. A LIA Board of Directors Meeting will be held in the late afternoon.

The annual LIA meeting will con- [illegible] April 6, an announcement will be made of the election of ZI officers and the treasurer's report will be delivered as part of the morning session. The use of zinc in automobile design during the 1973-80 period and use of zinc in appliances during next ten years will be discussed.

The Galvanizers Committee, a Zinc Institute-related association made up of U.S. and foreign companies who produce galvanized steel, will join the LIA/ZI luncheon on April 5 when the Zinc Institute makes its annual Sponsors Award. The Galvanizers Committee will join the ZI for the noon luncheon on April 6.

General publicity resulting from releases announcing LIA Annual Meeting and selection of LIA Board of Directors

---

33-2 AMERICAN METAL MARKET
[illegible]

MAR 5 1973

calendar of events

The listing of industry meetings and other events is published regularly on the first Monday of each month.

APRIL

1-4 — Material Handling Institute Equipment Association, Regency Hyatt House, Atlanta. (Contact Material Handling Institute Equipment Association, 1326 [illegible] Rd., Pittsburgh, Penn.)

[illegible] Manufacturing Engineers, 20501 Ford Rd., Dearborn, Mich. 48128)

4-6 — Lead Industries Association and Zinc Institute, annual meeting, Sheraton-Cadillac, Detroit, Mich. (Contact Lead Industries Association, 292 Madison Ave., New York, N.Y. 10017.)

9-12 — Design Engineering Conference and Show, Philadelphia Civic Center. (Contact Clapp & Poliak, Inc. 245 Park Ave., New York, N.Y. 10017.)

9-12 — American Metal Stamping Association Technical Conference, Pfister Hotel, Milwaukee. (Contact AMSA, 27027 Chardon, Cleveland, O.)

At LIA, ZI joint meet

Producers shed bearish outlook confident about continued growth

DETROIT (Staff) — Some 300 members of the Lead Industries Association (LIA) and Zinc Institute (ZI) met last week in the auto capital of North America to take stock of their two sister industries and to explore avenues for their future growth.

The occasion was the 45th annual meeting of LIA and the 54th annual meeting of ZI. Detroit's selection as venue of the joint meetings was symbolic of the two base metals' heavy reliance on auto industry.

In sharp contrast to last year's meetings held in Montreal where the producers were quite vocal in expressing concern about health of the two industries, the representatives met in a rather festive mood.

A number of guest speakers introduced the producers to some upcoming challenges. The distant problems however failed to perturb the prevailing affluence mood in the industry.

Consumer demand and the prices of lead and zinc have improved considerably, much beyond even the high expectations of some producers at this time last year. And for that reason no paper was presented projecting consumption and prices of the metals.

In private discussions lead and zinc producers expressed satisfaction over the rate of demand for the metals and the prices they are realizing. A number of U.S. zinc producers, in fact, confided that demand for their metal is so strong that they would like to raise the price further but for fear of retaliation from Washington.

See Page 23

Lead, zinc producers confident

Continued from Page 1

A majority of the U.S. zinc producers present at the ZI meeting for that reason were quite critical in private conversation about New Jersey Zinc's voluntary move last week to freeze its current price levels until July 31. Their disappointment is quite understandable when one notes that NJZ's Prime Western is pegged at 20.25¢ a lb compared with a range of 21-22.5¢ a lb for imported metal.

The gloom that pervaded the lead industry in Montreal in 1972 was almost non-existent at Detroit when the LIA meeting opened on the morning of April 4. Throughout the day and much of the next the lead producers heard that the industry has blunted the attack of the environmentalists. Hopes were aired that the Environmental Protection Agency (EPA) after all will not press for the proposed schedule to take lead out of gasoline.

Some speakers noted that the United States is heading towards an energy and fuel crisis of great dimensions, and if lead from gasoline were phased out as proposed the crisis would set in sooner. A no-lead gas gives less mileage per gallon.

The lead industry was also told by a representative of the battery industry that the latter is turning out a greater number of batteries than ever before and that demand is expected to continue to grow at an accelerated rate. In the United States the battery industry accounts for 40% of the total lead consumption.

The gathering was informed by the International Lead Zinc Research Organization's Director of Research S. F. Radtke that the Seven Cities Survey has shown that airborne lead has no effect on the concentration of lead in blood. He also pointed out that studies have shown that lead serves a biological need and its presence in [illegible]

[illegible] crease from 1962 when the battery portion was 30%.

According to J. A. Peterson, Director Purchases, Prestolite Battery Division, Eltra Corp., consumption of lead by the battery industry should further increase its share of total lead consumption. He estimated the batteries will represent over 51% of lead consumption by 1980 provided all other uses including TEL continue their past trend.

He however informed the gathering that inspite of the reliance of batteries on lead and vice versa, "we are constantly trying to take lead out of batteries," he reasoned.

Lead is the largest single item in our manufactured cost and therefore the most fertile area for potential cost savings. In the past, lead was removed through elimination of thinner plates and smaller connectors. The move to thinner grids was accomplished through improved antimonial lead alloys and grid design.

The total lead going into batteries will be reduced from the 25 lbs. per battery that it has been running for the last few years to 22½ lbs. per battery by 1980.

Mr. Peterson however emphasized that inspite of this reduction in unit weight, lead consumption will increase because the market is expanding at a faster rate.

"So," concluded Mr. Peterson, "with the battery weight going down and the battery market going up, the net result is an increase in battery lead consumption, an increase of 3% by 1980 to 850,000 short tons per year."

Dr. Radtke pointed out that the lead and zinc industry is preparing today in many of the research and development projects being conducted by ILZRO for the future.

The areas where research is being conducted include die casting, galvanizing, plating and [illegible], batteries, wrought lead and zinc, environmental health and industrialized housing.

He concluded that "on the basis of the alert and intensive research and development effort supported by the worldwide lead and zinc industry over the past 15 years, I have every confidence that our industry will continue to meet the challenge of change with the same [illegible]"

Less lead for auto body

On the other hand, F. E. Toth, Supervisor, Industrial Hygiene Section of Ford Motor Co. advised that the auto industry is conducting a vigorous campaign to reduce the amount of lead in auto bodies because of government pressure to reduce their composition of paints. Economic reasons was also cited for the move.

Mr. Toth however agreed with H. E. Hesselberg of Ethyl Corp., a major producer of lead antiknocks, that the EPA's attitude towards lead is pseudo-scientific.

Mr. Hesselberg pointed out that there is an increasing realization that meeting the emission standards as they are set forth in the Clean Air Act of 1970 by any of the proposed methods will be extremely expensive, not only in terms of dollars but in terms of depleting critical crude oil supplies.

He noted that more and more informed individuals are questioning whether the drastic reductions called for by the present law are really necessary.

Lead in gasoline

He observed that both the automotive and petroleum industries have been saying recently that slight relaxation in the required emission levels would permit the use of systems that would not require non-leaded gasoline in the less efficient low compression engines, and that the savings to the motorist would be tremendous.

He added that the EPA's position on the health effects of airborne lead has been thoroughly discredited by the scientific community.

He quoted Dr. Anna M. Baetjer, Prof. Emeritus of Johns Hopkins University, who said that most of the data in the EPA's study on the health effects of airborne lead is based on speculation and on assumptions, and on extrapolation of the data from one area to the other.

Battery business booming

The battery industry is taking an ever increasing portion of the total U.S. lead consumption and [illegible]

Challenge from aluminum

D. J. Kopka, Executive Director, Design Center, Ford Motor Co., expressed the hope that as in the past the zinc industry and auto industry "can share a profitable future."

He however emphasized that "there is absolutely no doubt in our minds that the car as we have come to know it is in for some changes that could turn out to be fairly fundamental. These changes will not be just in the shapes that the designer desires for better function or more aesthetic appeal."

He sees aluminum and plastics playing a great role in manufacturing the autos of tomorrow replacing some functions of zinc in today's cars.

Heavy appliance and zinc

E. I. Kaeser, Director of Engineering, Consumer Products Division, Westinghouse Inc., speaking on the outlook for the continued use of zinc in the major appliance industry, observed that in the coming years the use of zinc for unpainted steel parts, including hardware, will remain about constant on a per unit basis but that other significant usages of zinc will decline in favor of replacement by plastic parts because of performance characteristics.

"Future is of growth"

Concluding the annual meeting of the Zinc Institute on Apr. 6, its new president Simon D. Strauss, Executive Vice-President, American Smelting & Refining Co., observed that "our future, as our past, is of growth." He emphasized that the zinc industry is bound to play a definite role in the economy and "as economy expands zinc will have its share."

D. B. Craig, Executive Vice-President of St. Joe Minerals, was [illegible]

SPECIAL ANNUAL MEETING PUBLICITY.....

Feature article published in:

THE NORTHERN MINER -- April 12, 1973

LIA15020

APR 1973

Craig to Head Lead Association

D. B. Craig, executive vice president, St. Joe Minerals Corporation, New York, was re-elected president and chairman of the board of directors of the Lead Industries Association, Inc.

Re-elected vice presidents of the Association during the 45th annual meeting in Detroit were: T. M. Smythe, Ethyl Corporation, Baton Rouge, La.; J. F. Rosenbaum, Eltra Corporation, Plymouth Meeting, Pa.; and J. G. McCullough, Amax Lead & Zinc, Inc., Clayton, Mo.

L. E. Gage, director of communications for LIA, was elected to the additional post of assistant secretary.

Other officers re-elected by LIA were: F. E. Robinson, executive vice president, J. F. Smith, secretary and general manager, R. J. O'Hare, Amax Lead & Zinc, Inc., Clayton, Mo., treasurer, and Mrs. D. L. Moore, comptroller and assistant treasurer.

lead and zinc market

Lead Industries Association Re-elects Craig to Top Post

DETROIT — D. Brenard Craig, executive vice-president, St. Joe Minerals Corp., New York, last week was re-elected president and chairman of the Lead Industries Association, Inc.

At its 45th annual meeting, held here, T. M. Smythe, Ethyl Corp., Baton Rouge, La., J. F. Rosenbaum, Eltra Corp., Plymouth Meeting, Pa., and J. G. McCullough, Amax Lead & Zinc Inc., Clayton, Mo., were reelected vice-presidents of the lead marketing association.

L. E. Gage, director of communications for LIA, was elected to the additional post of assistant secretary.

Other officers reelected by LIA were F. E. Robinson, executive vice-president, J. F. Smith, secretary and general manager, R. J. O'Hare, Amax Lead & Zinc, Inc., Clayton, Mo., treasurer, and Mrs. D. L. Moore, comptroller and assistant treasurer.

J. A. Mardick, vice-president, Metals Division, NL Industries, and R. H. Ramsey, vice-president, Newmont Mining Corp., both of New York, were elected directors of the Association.

Directors who were reelected were D. Brenard Craig, St. Joe Minerals Corp., New York, J. G. McCullough, Amax Lead & Zinc, Inc., Clayton, Mo., Simon D. Strauss, American Smelting & Refining Co., New York, F. R. Osborn, Broken Hill Associated Smelters Pty. Ltd., Melbourne, Australia, J. C. MacLean, Cominco American Inc., Spokane, R. T. [illegible] Cominco Ltd., Vancouver, B.C., L. M. Herman, Dresser Industries, Inc., Houston, R. G. Brandle, E.I. du Pont de Nemours & Co., Wilmington, Del., R. J. Kenny, ESB Inc., Philadelphia, R. A. [illegible], American Smelting & Refining Co., New York, R. A. Gardner, Jr., Gardner Metal Co., Chicago, R. H. Ramsey, Newmont Mining, New York, W. H. Love, Hecla Mining Co., Wallace, Id., P. C. [illegible], Morenci Lead Co. of Missouri, San Francisco, J. A. Mardick, NL Industries, Hightstown, N.J., E.C. Hendren, Noranda Sales Corp. Ltd., Toronto, H. A. Krueger, Ozark Lead Co., Sweetwater, Mo., R. Vomer, Sprague Vomer & Sons, Richmond, Va., and T. M. Smythe, Ethyl Corp., Baton Rouge, La.

ZINC INSTITUTE ELECTIONS

S. D. Strauss, executive vice president, American Smelting & Refining Co., has been elected president and chairman of the Board of Directors of the Zinc Institute, Inc.

Elected vice presidents were J. R. Alexander, The New Jersey Zinc Co., Bethlehem, Pa., J. C. Duncan, St. Joe Minerals Corp., New York, N. Y. and R. D. Madison, Texas Gulf, Toronto, Canada. R. J. O'Hare, Amax Lead & Zinc, Inc., Clayton, Mo. was re-elected treasurer.

MAY 1973

Simon D. Strauss, executive vice president of American Smelting and Refining Co., has been elected president and chairman of the board of the Zinc Institute, Inc., and D. B. Craig, executive vice president of St. Joe Minerals Corp., was re-elected president and chairman of the board of the Lead Industries Association, Inc.

MAY 1973

Simon D. Strauss, executive vice president of American Smelting and Refining Co., has been elected president and chairman of the board of the Zinc Institute, Inc., and D. B. Craig, executive vice president of St. Joe Minerals Corp., was re-elected president and chairman of the board of the Lead Industries Association, Inc.

MAY 21 1973

• • •

D. Brenard Craig, Executive Vice President, St. Joe Minerals Corporation, has been appointed to the Board of Directors of The Burke Rehabilitation Center, it was announced by John S. Coard, Board President. A graduate of Harvard College and Harvard Law School, he was

APR 26 1973

Lead Industries Association

Personnel Announcement........

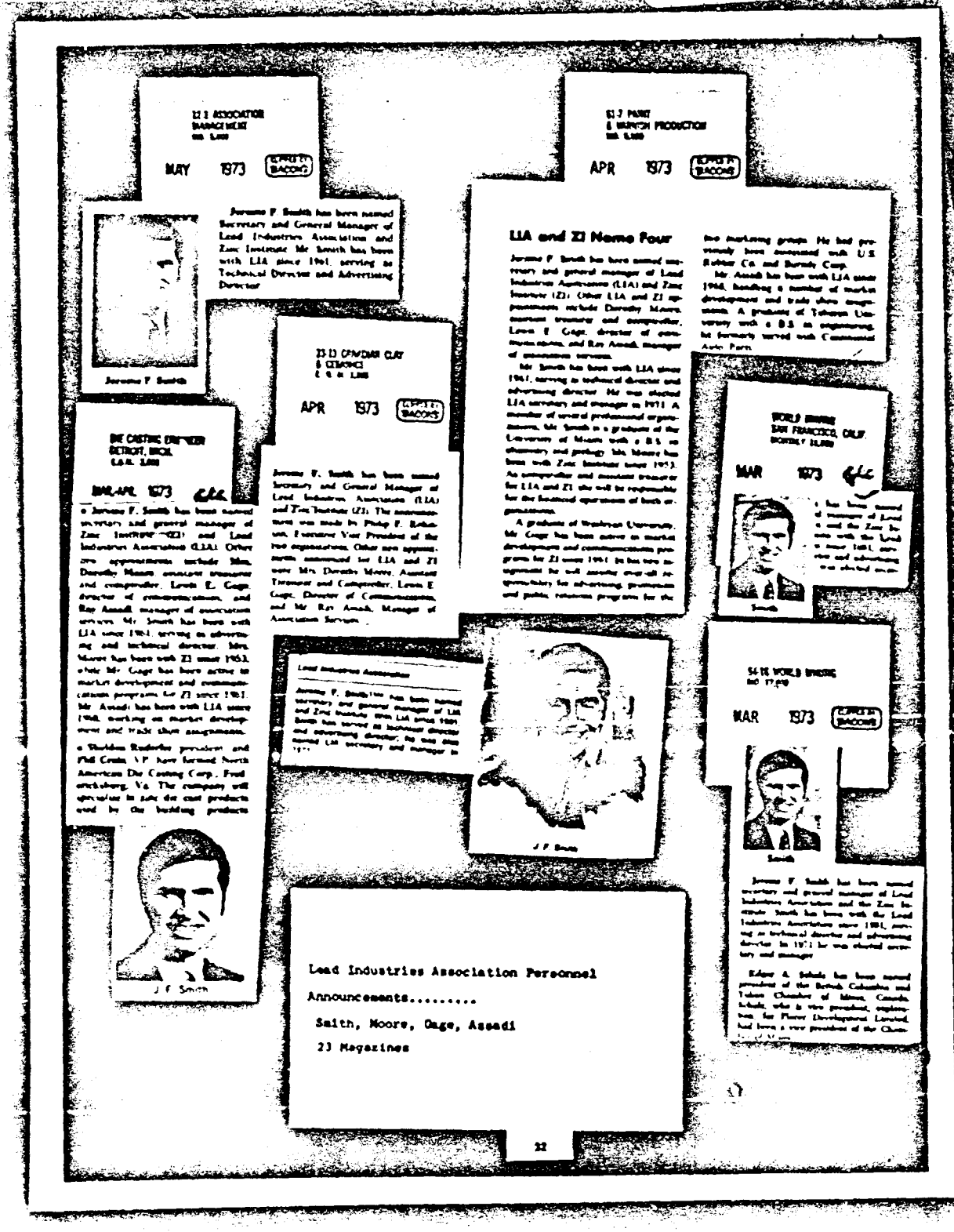
D. B. Craig Elected to President & Chairman of Lead Industries Association, Inc.

MAY 1973

APPOINTMENTS

- Chloride Automotive Batteries, Ltd., Harry Lynch becomes managing director.
- Chloride Industrial Division, Leonard Greening was appointed to the new position of European Director.
- Chrome Electric Corporation, R.L. McDonald is the new manager, Motive Power Sales.
- Globe-Union, Inc., the board of directors have approved the nomination of John Arrol to vice president and chief financial officer.
- Lead Industries Association, Inc., at the 45th Annual Meeting D.B. Craig, executive vice president of St. Joe Minerals Corporation, was re-elected president and chairman

LIA15021


MAY 1973
Jerome F. Smith has been named Secretary and General Manager of Lead Industries Association and Zinc Institute. Mr. Smith has been with LIA since 1961, serving as Technical Director and Advertising Director.
APR 1973
LIA and ZI Name Four
Jerome F. Smith has been named secretary and general manager of Lead Industries Association (LIA) and Zinc Institute (ZI). Other LIA and ZI appointments include Dorothy Moore, assistant treasurer and comptroller, Lewis E. Cage, director of communications, and Ray Arnold, manager of association services.
Mr. Smith has been with LIA since 1961, serving as technical director and advertising director. He was elected LIA secretary and manager in 1971. A member of several professional organizations, Mr. Smith is a graduate of the University of Miami with a B.S. in chemistry and geology. Mrs. Moore has been with Zinc Institute since 1953. As comptroller and assistant treasurer for LIA and ZI she will be responsible for the financial operations of both organizations.
A graduate of Wesleyan University, Mr. Cage has been active in market development and communications programs for ZI since 1961. In his new assignment he will assume responsibility for advertising, promotion and public relations programs for the zinc industry.
Mr. Arnold has been with LIA since 1968, handling a number of market development and trade show assignments. A graduate of Tuskegee University with a B.S. in engineering, he formerly served with Commercial Auto Parts.
APR 1973
Jerome F. Smith has been named Secretary and General Manager of Lead Industries Association (LIA) and Zinc Institute (ZI). The announcement was made by Philip F. Robinson, Executive Vice President of the two organizations. Other new appointments announced for LIA and ZI were Mrs. Dorothy Moore, Assistant Treasurer and Comptroller, Lewis E. Cage, Director of Communications, and Mr. Ray Arnold, Manager of Association Services.
MAR 1973
MAR 1973
Lead Industries Association Personnel
Announcements.....
Smith, Moore, Cage, Assadi
23 Magazines
22

LIA15022

MAR 1973

AWS Presents Big Chicago Package

54th Annual Meeting
1973 Welding Show
AWS Technical Sessions
2nd International Soldering Confe
4th International Brazing Confere
Social and Special Events

MAR 22 1973

New ideas, workshops, consultants spark '73 Welding Show in

WELDING JOURNAL
MIAMI, FLA.

MAR 1973

Some 1973 Welding Show exhibitors

Second International AWS Soldering Conference

(Co-sponsored by Lead Industries Association)

Tuesday—April 3

MAR 1973

Welding show and AWS meeting scheduled

JOINT CONFERENCE WORKSHOP.....
AMERICAN WELDING SOCIETY'S BRAZING
AND SOLDERING WORKSHOP

170 | MARCH 1973

33

MAR 1973

FEB 28 1973

Soldering Conference Slated

NEW YORK — The Lead In
American Association and the
American Welding Society will co-
sponsor the second international
soldering conference, which is
scheduled for April 3-4 in Chicago.
Subjects to be discussed include
such solder areas as new materials
and products, and the latest
developments in workmanship,
equipment, atmosphere and flux
vs. environmental controls and
soldering.

LIA15023

Literature Availability Announcement:

"LEAD....AS A MODERN DESIGN MATERIAL"

Published in more than 25 magazines

for your information

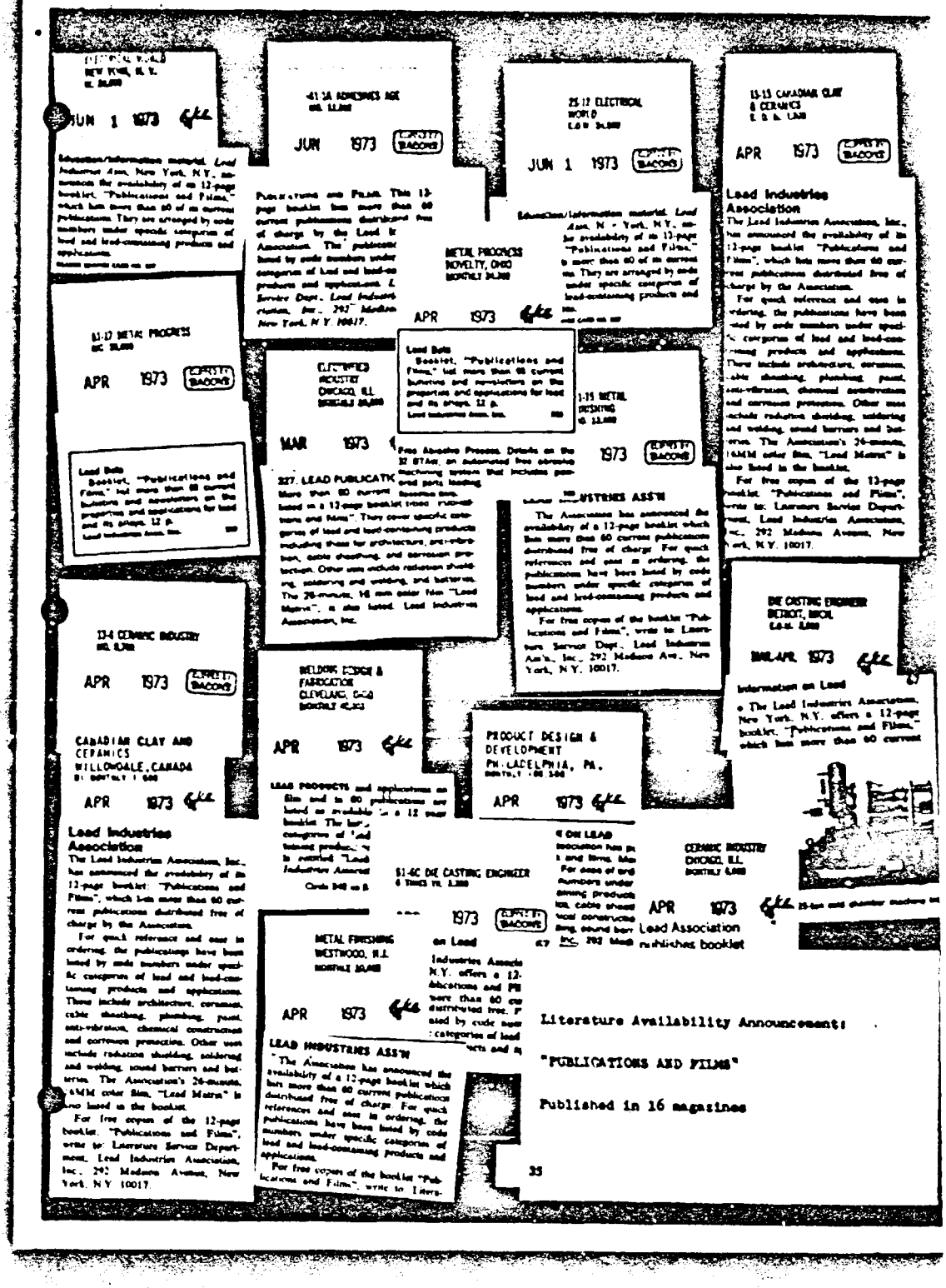
tidbits...

Uses of Lead

Book Reviews

Lead Assn. Booklet

34



Literature Availability Announcement:

"PUBLICATIONS AND FILMS"

Published in 16 magazines