



Lead Industries Association, Inc.

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October 19, 1973

SUBJECT: PUBLICITY STATUS REPORT
THIRD QUARTER -- 1973

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

Enclosed is the Third Quarter Report on articles and releases placed in the business press during the months of July through September of 1973.

Feature articles have continued to be printed in leading publications, and the backlog of material which we have been working on, leads us to expect an even better report during the next three-month period.

Very truly yours,

Lewis E. Gage
Assistant Secretary and
Director of Communications

LEO:mk1
Enclosure

October, 1973

LEAD INDUSTRIES ASSOCIATION
TRADE PUBLICITY PROGRAM
THIRD QUARTER
July-September, 1973

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

- * Three articles on the use of battery-powered, special-purpose personnel carriers to replace diesel-powered vehicles at Morton Salt Company's Painesville, Ohio mine -- published in AMERICAN METAL MARKET, ENGINEERING & MINING JOURNAL, and ELECTRIC VEHICLE NEWS.
- * Two feature articles on the use of battery-powered lift trucks to replace propane fueled internal combustion vehicles at Aberdeen Tricot, Inc., a knitting company in Aberdeen, W.C. Articles appeared in MODERN KNITTING MANAGEMENT, and MODERN MATERIALS HANDLING.
- * Three articles on the new 18-ft.-long pleasure boat from the Branson Boat Company, Salerno, Florida. The article has appeared in ELECTRIC VEHICLE NEWS, AMERICAN METAL MARKET, and MARINE RETAILER.

- * Two articles discussing the possibility of using battery-powered buses to solve vehicular pollution problems.

A release discussing the use of....SHEET LEAD SOUND BARRIERS at:

- * A new Arts and Drama Center at Baldwin-Wallace College, Berea, Ohio. Sheet lead was used as roofing to provide an additional sound barrier between aircraft noise and the theaters inside. Release appeared in SOUND AND VIBRATION.
- * A release on the use of sheet lead to solve noise control problems in the new Justice Building in Montreal, Canada, was published in NOISE/NEWS.
- * A news article describing the use of lead/foam machinery noise control panels designed to meet OSHA standards was published in PRODUCTION MAGAZINE.
- * A full-page color photo feature discussing the use of sheet lead to develop a machinery noise control panel system for Long Island Lighting Company's Northport, N.Y., plant was published in DESIGN NEWS.

- Editorial contact resulted in publication of a major feature article on lead/zirconate/titanate piezoelectric (PZT) components in MATERIALS ENGINEERING magazine.
- Publicity announcing the LIA exhibit at the 25th Annual Construction Specification Institute Meeting June 25-27 in Washington, D.C. was published in such magazines as COMMERCIAL CONSTRUCTION NEWS and AMERICAN METAL MARKET.

Four literature availability announcements appeared in a wide variety of magazines during the reporting period. The announcements included the following publications:

- "Annual Review of Lead Industry"
- "Lift Profits Electrically"
- "Practical Application of Sheet Lead for Sound Barriers"
- "Lead Magazine"

Releases announcing the re-election of D. Broward Craig and other personnel to various LIA posts appeared in such publications as ENGINEERING & MINING JOURNAL, BATTERY MAN, WELDING ENGINEER, PAINT & VARNISH PRODUCTION, MINING ENGINEERING and MATERIAL HANDLING.

Feature articles discussing a variety of lead applications have been completed and they are slated for publication in more than a dozen magazines.

- * A feature story on the use of lead acid battery-powered postal delivery vehicles to appear in FLEET OWNER, PRODUCT ENGINEERING, and ELECTRICAL WORLD magazines.

- * A case history telling how lead acid batteries provide uninterruptible power for IBM's computerized headquarters, to appear in ELECTRICAL WORLD and MODERN OFFICE magazines.

- * A news article describing how sheet lead was used to line pollution control equipment at a major Canadian copper mine is slated to appear in MINING & ENGINEERING JOURNAL and NORTHERN MINER.

- * A wrap-up on the latest developments in the use of sheet lead to solve industrial machinery noise control problems will be published in PRODUCT ENGINEERING, POLLUTION ENGINEERING and SOUND & VIBRATION magazines.

* Two related stories -- one telling how Grumman Aviation Corp. uses leaded vinyl to insure quietness inside the company's Gulfstream II executive jet and another telling how the material has been used in the 300 mph rail-mounted tracked air cushion vehicle Grumman has built for the Department of Transportation's high-speed transportation demonstration program -- have been released to railroad and commercial aviation magazines.

* A feature article on a fleet of new battery-powered undersea workboats is slated for publication in OFFSHORE and OCEAN INDUSTRIES magazines.

....and watch for publication of articles discussing the use of "reclaimed" leaded stained glass in homes, apartments and restaurants; the use of lead/zirconate/titanate in piezoelectric applications; and the use of organolead in wood preservatives; and the use of sheet lead at the World Trade Center.

Also slated for publication is an article based on J. A. Peterson's paper, "Lead in the Automobile Industry Batteries". Presented at the LIA Annual Meeting, the article will appear in the November issue of AUTOPRODUCTS Magazine.

Feature Articles Published.....10

News Articles Published (including
literature availability announcements)..33

News Releases Completed (including
personnel announcements and litera-
ture availability announcements).....14

Feature Articles in Preparation..... 8

Editorial Request Responses..... 7

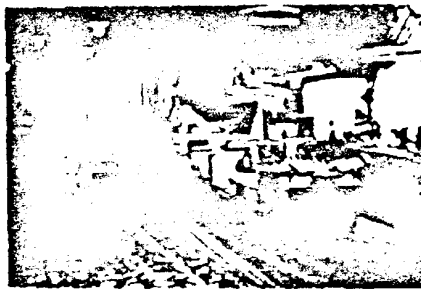
Vol. 2 No. 2

MAY 1973
(Published Quarterly)
\$2.50

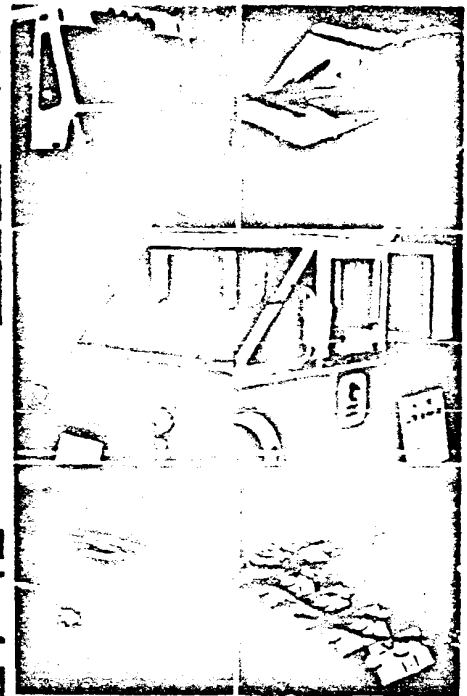
EVs GO BACK TO THE SALT MINES

Vehicle News

Committed To Better Transportation



Three of the five new battery-powered electric personnel carriers purchased by the Marion Salt Company to replace diesel-powered vehicles at the company's Pennsylvanian Ohio salt mine are now operating at the mine's main level, located 2,800 feet below ground at the working level of the mine. BOTTOM - A new supervisor prepares to take one of the new two-man battery-powered personnel carriers on a tour of a 4,000-foot-long rock salt work face that has been prepared for blasting. The vehicle on the far left is the biggest of the five new electric vehicles and it can be adapted for use in hauling small parts and supplies. All five of the electric vehicles have been fitted with undercarriage tires to provide good traction on the floor of the mine, which is covered with a layer of fine rock salt.



Article: EV's Go Back To The Salt Mines

Published in: ELECTRIC VEHICLE NEWS

May, 1973

JUL 1973

Ohio salt mine now using lead acid battery-powered personnel carriers

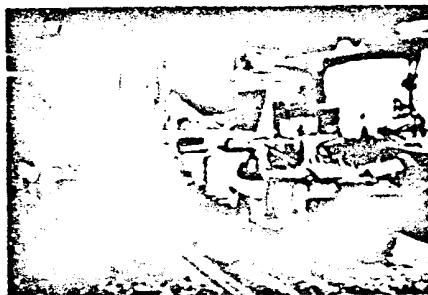
Morton Salt Co. recently converted its lead battery-powered personnel carriers from diesel to lead acid battery-powered. The conversion was made at its 1,000-ft-deep Fanninville, Ohio, mine, where the firm produces 11 million lbs of rock salt by the mine and pillar method. The mine is located on the shore of Lake Erie, about 10 mi west of Cleveland, and has a vast bed of what is believed to be one of the world's largest rock salt deposits.

Until recently, underground personnel carriers transported to and from work locations in diesel-powered personnel carriers. A maintenance crew operating these carriers transported them to the mine's loading level after which the carriers for some personnel to and from job assignments. In addition, the carriers were used to deliver rock parts to and from the mine's storage and the bottom of the shaft. The carriers had a wide open end, and from the bottom of the shaft to the maintenance shop, they had a wide open end.

Now all the personnel carriers are lead acid battery-powered. According to the company's maintenance shop, the conversion was made because the diesel carriers were too noisy and the lead acid carriers are quiet and provide a comfortable ride. Maintenance shop manager says that the diesel carriers are too noisy and the lead acid carriers are quiet and provide a comfortable ride. Maintenance shop manager says that the diesel carriers are too noisy and the lead acid carriers are quiet and provide a comfortable ride.

A trial of five battery-powered personnel carriers is being made at the mine. All five vehicles are equipped with emergency lights. One of the carriers, the largest, has been a new diesel carrier. The trial is being made to determine if the battery-powered carriers can be used to haul parts and supplies. "There will continue to be a need for diesel carriers to perform a number of heavy hauling jobs involved in the mine's day-to-day operation of the mine," explained Markley. "However, it is expected that the electric vehicles will provide us with an economical and practical means of exploring a number of our other diesel trucks."

The batteries used to power the carriers of the new vehicles are 6-volt, and they range from 175 to 225 amps. Under normal conditions, they take required time to charge. The largest of the vehicles is powered by a 14-volt, 200-amp, 100-hour battery. These batteries are recharged at the end of the charging period, rather than at the beginning, to avoid the possibility of the vehicles being used to haul personnel during the charging period.



However, they take required time to charge. The largest of the vehicles is powered by a 14-volt, 200-amp, 100-hour battery. These batteries are recharged at the end of the charging period, rather than at the beginning, to avoid the possibility of the vehicles being used to haul personnel during the charging period.

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Feature article: "Ohio Salt Mine
Now Using Lead Acid Battery-Powered
Personnel Carriers"

Published in: ENGINEERING & MINING
JOURNAL

July, 1973

lead and zinc market

Morton Carriers Battery-Run

PAIDVILLE, Ohio — The replacement of diesel-powered personnel carriers with lead and battery-powered carriers at Morton Salt Co. has resulted in improved personnel movements and its quality.

John J. Barkus, assistant mine manager, said, "The new vehicles are quiet and provide a comfortable, more noticeable ride than the diesel tractors we use for our work here. Of particular importance to us is the battery-operated system has no exhaust with

A total of five battery-powered

personnel carrier vehicles are now

in use at the mine. All five can

transport four supervisors, Morton

said. One of the carriers, the largest

of the five features a rear-mounted

compartment that can be used to

haul parts and supplies.

The vehicles are standard in-

duced models that have been

tested with only four hours in order

to ensure good traction on the floor

of the mine which is covered with a

thin layer of coarse rock and

ensuring the most resistance to

traction is lost.

Compared to ordinary features of

quiet operation, Barkus, rugged

construction, and give maximum

distance between battery charges,

the electric vehicles' simple

mechanical design requires a

minimum of maintenance accord-

ing to Barkus.

There will continue to be a need

for diesel tractors to perform a

number of heavy hauling and pull-

ing jobs involved in the everyday

operation of the mine," explained

the assistant manager. "However,"

it is expected that the electric

vehicles will provide to with an

economical and beneficial means of

replacing a number of our other

small tractors.

The batteries used to power the

vehicles of the mine vehicles are 6

volt. Their range is from 100

to 120 and, unlike automobile

batteries, they take repeated deep

cycling, or charging and discharg-

ing. The largest of the five vehicles

is powered by a 24-volt, DC

traction type motor which

transmits power to a worm gear

driven through a modified set

of three drive belts.

An automatic battery charger has

been incorporated in the design of

the five vehicles and it is a rugged

and dependable piece of equip-

ment, Morton said.

Empire Metal Company

200 West 10th Street, Erie, Pa.

Circle 10 on Reader Service Card

No Steady Pattern Viewed
In Platinum, Palladium Rise

NEW YORK — While dealer values for platinum and palladium are consistently higher this week over last, the picture is not considered steady due to the irregular behavior of gold, trade sources said. Meanwhile, the dollar continues to strengthen in Europe.

Yesterday, the national dealer value for platinum was put at \$261.50 a fine ounce, \$5.50 over last week's figure, while palladium advanced \$1.50 to \$22.50 an ounce. The domestic market was reported to be a little weaker due to the weaker performance of gold on yesterday's London market.

London platinum and palladium were reported irregular due to monetary uncertainties and the erratic pattern of other precious metals. Much of the activity was attributed to short-covering and narrow liquidation, according to trade sources.

to 120 and, unlike automobile batteries, they take repeated deep cycling, or charging and discharging. The largest of the five vehicles is powered by a 24-volt, DC traction type motor which transmits power to a worm gear driven through a modified set

of three drive belts. An automatic battery charger has been incorporated in the design of the five vehicles and it is a rugged and dependable piece of equipment, Morton said.

Feature article: Morton Carriers
Battery-Run

Published in: AMERICAN METAL MARKET
July 11, 1973

41-27 MOORE
RAILROADS MAILING
NO. 41,273

JUN 1973

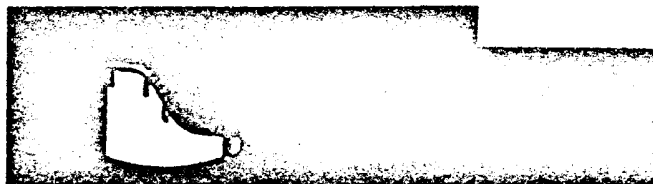
CURTIS
MOORE

Feature article: "Lead Acid Battery

Solves Environmental Problems"

Published in: MODERN MATERIALS HANDLING

June, 1973



Battery powered truck solves environmental problems

The substitution of a lead-acid battery-powered lift truck for one powered by an internal combustion engine has solved a number of perplexing corrosion and environmental problems at Aberdeen Tricot, Inc., in Aberdeen, N.C.

Company president Loren Fagelman, reports that after the installation of the new electric truck there was a marked reduction of rising on knitting needles, machinery parts, and other plant equipment. Employees also were no longer suffering from minor burners and minor eye irritation.

The replacement came about after extensive tests by the Carolina Power & Light Co. and an independent laboratory indicated

that the corrosive effects and high air pollution were caused by exhaust in the controlled plant atmosphere.

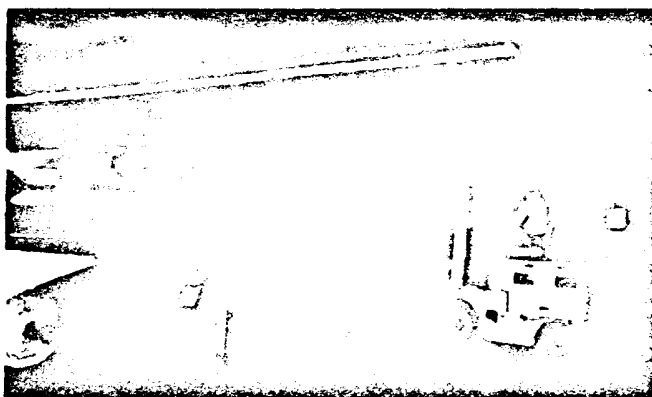
The corrosive conditions became critical where they developed on the hundreds of delicate knitting needles attached to the 14-ft long needle bars of about half of the 14 knitting machines in the plant. The corrosive attack was particularly aggressive when the machines were stopped to change a knitting pattern. The needles became corroded before the knitting operators could begin again. Corroded needles prevent yarn from traveling through the knitting zone.

An estimated \$1,000 was spent to replace knitting needles during a two-month period to address production time was also lost due to

machinery downtime required to change the needles.

During the 18 months, the electric lift truck has been in operation, the plant has experienced no noticeable corrosion action or incidents of burners or eye irritation.

The truck used at Aberdeen Tricot has a 4000-lb. capacity. It is fitted with a long pole which is used to move wrapped circular rolls of cloth onto trucks at the loading dock or to unload bundles of fabric cores which are used to wrap the rolls of cloth. When large spools of yarn, called bobbins, are to be moved into the plant or to and from the knitting machines, the long pole is replaced with two forks. Lead Industry Association, Inc.



MOORE RAILROADS MAILING, JUN 1973

36-42 MODERN KNITTING
MANAGEMENT
Vol. 7, No. 5

MAY 1973

Lead Acid Battery Solves Multiple Production, Environment

environmental health problems and this theory was strengthened by the fact that the company pro-

The conversion of a lead acid battery-powered lift truck for use powered by a propane fueled internal combustion engine has solved a number of perplexing production and environmental problems at Aberdeen Trust, Inc., a knitting company in Aberdeen, N.C.

Company president, Glenn Fogelman, reports that the following facts became evident soon after his plant began operating:

- Knitting needles, machinery parts and other plant equipment were rusting.
- Excessive maintenance and parts replacement were required to keep the plant operating.
- A few employees were suffering from minor rashes and minor eye irritations.
- Production and sales were decreasing due to equipment downtime and a loss in productivity.

The solution to the problems, all of which were found to be related to the use of propane fueled lift trucks, is an interesting case history of a search for the source and effects of pollution in the developing under certain conditions in the restricted atmosphere of an industrial plant.

Closely controlled temperature and humidity conditions are critical requirements for the production of quality knit fabric. At Aberdeen Trust, the temperature is kept at 70 to 80°F. Humidifiers automatically maintain a relative humidity of 55 per cent.

The temperature and humidity, combined with exhaust fumes from a propane-fueled fork lift truck, were first thought to be causing the corrosion, eye irritation and nose problems noted. They were most evident in the production area of the plant where the truck operated. Steps were therefore taken to replace the truck's carburetor, tune the engine and change the fuel tanks, thinking that some foreign elements may have been placed in the tanks.

Then, during the maintenance work done on the plant, it was found that when the drive of attached parts of the long maintenance apparatus were the pattern, rusted to such an extent that they had to be replaced.

With the coming of winter, the rusting of the machinery and the health of the employees became a problem.

For a plant's safety, the needles attached to the trucks were placed in a knitting machine.

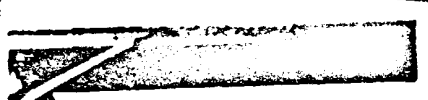
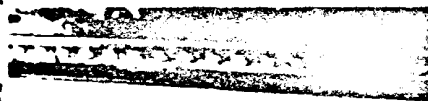
Needles might be lost. The truck operator was told to place the needles in the back of the building, and some distance from where the truck operated.

The plant at 10 hours. While this also tended to prove the propane fuel fork lift truck theory, it was felt that the rust was incombustible because of the difference in conditions at the front and rear of the plant.

The problem was also discussed with a staff member of the North Carolina State Industrial Extension Service and it was learned that propane can contain sulfur which can be oxidized in the truck engine and result in sulfuric acid fumes being emitted into the air.

They were therefore assured that presence of sulfuric acid fumes, plus sulfuric acid fumes, could promote the high rate of machinery rusting.

Based on this combined evidence, Aberdeen Trust president Fogelman ordered a lead acid battery-powered fork lift truck as a



One of the effects of corrosion from a propane fueled vehicle was found that needles rusted away at the base of the needle and on a small component of the engine after work for about 12,000 hours. The needles and other parts were found using a lead acid battery-powered vehicle.

replacement for the propane fueled vehicle. During the 18 months the lead acid battery-powered fork lift truck has been in operation, the plant has experienced no noticeable corrosion at-

temptation. When the truck was moved with the vapor continuously during the humidifiers and then, with the truck per day, the needles and the needles a chemical reaction that is in the formation of sulfuric acid which is highly corrosive.

Ministry company representative also concluded that the rust was also the point that ultimately caused the rust and eye irritation. They at these two environments, he was attributed to two acid-based processes: gas, which is formed when sulfur dioxide, which is when sulfur dioxide combines with oxygen. The situation began because the atmosphere was reacting with the sulfur dioxide in the air.

to form more sulfuric acid.

tion and there have been no further incidents of rashes or eye irritation.

The electric truck used has a 4000-lb. capacity. It is fitted with a long pole when used to move wrapped circular rolls of cloth onto trucks at the loading dock or to unload bundles of knitwear which are used to wrap the rolls of cloth. To move the circular rolls of cloth or bundles of knitwear, the pole is inserted in a core and is used to lift the material to be transported. When large spools of yarn, called bobbins, are to be moved into the plant or to and from the knitting machines, the long pole is replaced with two forks.

Based on the successful use of the electric truck at the Aberdeen plant, another one was ordered for a new 34,000 sq. ft. plant that Fogelman manages just across the street.

Feature article: "Lead Acid Battery

Solves Environmental Problems"

Published in: MODERN KNITTING MANAGEMENT

May, 1973

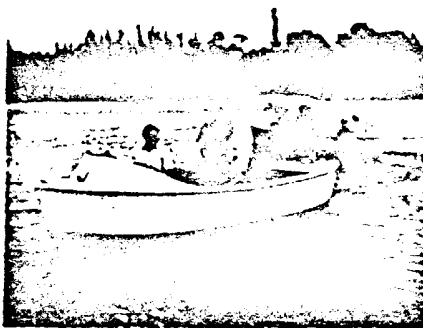
MAY 1973

WHAT'S AN EB? AN ELECTRIC BOAT!

The Bramson "Electric" 18-foot skiff is decidedly not for speed demons, but it does cut a smooth, graceful trough when it is underway. In the case the skiff's motor is really a motor—a permanent magnet (PM) D-56 motor rated at 1 1/2 hp and supplied by Ohio Electric Motors, Division of Magnadyn International, Inc., Maple Heights, Ohio.

Norman Bramson, President of Bramson Boat Company, Port St. Lucie, Florida, had a definite purpose in mind when he designed the Electric. For those who enjoy quiet, stress-free cruising or leisurely fishing, Bramson's boat is just the ticket. Capable of a cruising range of 30 miles at a speed of 3 miles per hour, the boat is virtually silent and produces no exhaust fumes. At 3 miles per hour, it can operate for over 12 hours.

The boat's power plant consists of two large, 12-volt, acid-conducted marine batteries rated at 272 ampere hours. Normally, the motor is rated at 1 1/2 hp operating at 48 volts dc, drawing 30 amps to deliver



With a draft of only 1 ft, the Electric lends itself for cruising close-to-shore. The boat's hull design provides protection for the heavy-duty bronze propeller and rudder as well. With more and more people seeking peace and quiet in nature, the Bramson Boat is making its mark.

1,750 shaft rpm. In the Electric boat, the motor shaft is coupled directly to a 10-inch diameter, three-bladed propeller which turns at approximately 350 rpm. At the full running speed of 5 mph, the motor draws about 25-30 amps, delivering an output of about 4 hp.

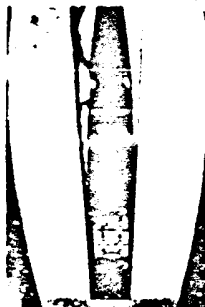
Commenting on the design, Mr. Bramson notes, "We know that it would be possible to use the smaller motor with speed reduction to provide the same boat speed, but the slow turning motor is silent operation, it is very rugged and provides long life.

In some of our experimental boats we used wound field motors. However, we have found that the permanent magnet motors are more efficient and produce less arcing during reversing. Speed is regulated by a solid state controller which is continuously variable to less than 1 mph.

"Recharging" is also simple. The propulsion system is outfitted with an automatic, transistorized battery charging device. At dockside, it can be plugged into any conventional 115-volt, 60-cycle power outlet. The charger cuts off automatically to prevent overcharging the batteries. With proper care, says Mr. Bramson, the batteries will last several years. The boat weighs approximately 1,100 lbs.

The boat is intended as an easy-going all-around family craft. Complementing the quietness, safety and ease of operation is a virtually maintenance-free design. The hull is custom fabricated from fibreglass reinforced plastic.

The hull and keel are designed for outstanding stability. Overall length is 18 ft 2 in., with a 5 ft 6 in. beam.



None of the propulsion plant for the "Electric" is a permanent magnet DC motor, supplied by Ohio Electric Motors and a pair of heavy-duty marine storage batteries. The motor is directly coupled to a 10-inch diameter, three-bladed propeller.

ELECTRIC VEHICLE NEWS/AUGUST 1973

Feature Article: "Battery-Powered
Pleasure Boat Introduced"

Published in: ELECTRIC VEHICLE NEWS

August, 1973

512 AMERICAN
METAL MARKET
BY G. B. B. B. B.
B. B. B. B. B.

AUG 17 1973

EXPERT
MARKET

Lead Batteries in Pleasure Boats Seen Answering Pollution Problems

FORT SALEM, Fla. — The use of lead acid batteries in pleasure boats help solve both noise and silencer pollution, according to Branson Boat Co. here.

The company uses two heavy-duty marine lead acid batteries to power its 18-foot long boat, called the Electro-18. Each of these batteries, installed in a lead box, delivers 272 amp hours at 24 volts.

Paul Harrison, Branson, president of the Florida boat company, "A lot of important considerations are entering standard power boats. Environmentalists and motorists are pressing hard for quieter boats producing noise and pollution. On the other hand, motorboaters want more power. Our boat is designed to eliminate these problems."

The standard power system for the boat, a permanent magnet electric

motor that delivers 5-horsepower, can run the boat for about 20 miles at 5 miles per hour cruising speed. Branson pointed out, at 3 miles per hour, the Electro-18 can be operated for 12 hours. A solid state controller permits variable speeds down to below 1 mile per hour, he said.

To recharge, dual automatic marine battery chargers are plugged into any 110-volt 60 cycle AC, the standard equipment. A two-wire circuit prevents overcharge and, with good care, the batteries should last several years, he added.

Designed for trolling, the boat is also gaining acceptance for leisurely sight seeing, jet-skiing and cruising in light traffic waters, said Harrison.

45-DE. MARINE RETAILER
IN FLA.

JUN 1973

EXPERT
MARKET

Lead Acid Battery Powered Boats.

The Branson Boat Company introduces the "Electro-18", an 18 foot long boat that is powered by lead acid batteries. Designed for trolling, it is getting acceptance for other uses since it reduces noise pollution and polluting of water by oil residues.

The Electro is powered by two heavy duty marine lead acid batteries, each delivering 272 amp hours at 24 volts and installed in a lead box. The lead box also contains the boat's electric pump and an automatic bilge pump that prevents the motor from flooding. To recharge, dual automatic marine battery chargers plug into any 110 volt 60 cycle outlet.

June, 1973

marine products

For more information contact
Mr. Lewis Gage Lead Industries
Association, Inc. 252 Madison
Avenue New York, New York
10017

Circle 28 on last Page

"Battery-Powered Pleasure Boat"

also appeared in: AMERICAN METAL
MARKET, and MARINE RETAILER



THE INTERNATIONAL JOURNAL FOR

Starting, Lighting, Ignition & Generating Systems

SEPTEMBER 1973

INCREASED POTENTIAL FOR BATTERY-POWERED BUSES

With the recent announcement that automobile manufacturers have a joint intention to meet the strict U.S. Government requirements for more efficient control of pollution emissions from automotive vehicles, major metropolitan areas such as New York City are considering plans to limit or restrict vehicles such as cars and buses in operation in certain heavily trafficked areas or sections. A lead and battery powered bus that's now being produced could be the answer to some of the major urban area transportation problems that might result from implementation of vehicular emission controls. For lead acid batteries has a lot to offer, one of the bus manufacturers' capability of meeting the need for urban area use, as well as for evening cruises, airports and other types of shuttle service.



Such an example is the 27 passenger bus that Cleveland Electric Machinery Company is using to transport commuters between its 24th Street Service Center and the company's headquarters located on Cleveland's downtown Public Square. The bus makes eight round trips each day on runs that are approximately 10 miles long. It is one of the lead battery powered buses built to be a permanent use in the United States and is sold by the manufacturer of a planned urban mass transit system for an American city.

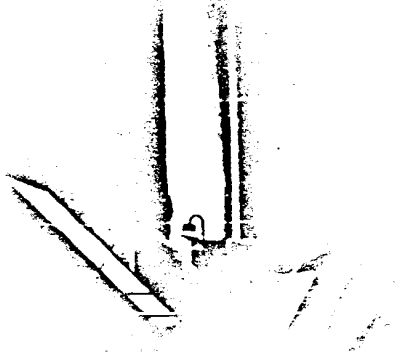
The new bus is designed and manufactured by Batteries Truck Corp., of Birmingham, Pa. It has a top speed of 25 miles per hour, based on city speed limits, and has a maximum range of 40 miles before the batteries have to be recharged or changed. Batteries Truck developed a new self-contained battery system that permits removal and replacement of the lead acid battery power cell in less than two minutes. This means that the vehicle no longer has to be tied to a battery charger for long periods or taken out of service while the batteries are changed.

CLEAN AIR
VEHICLES AND COMPONENTS

News article: Increased Potential
for Battery-Powered Buses

Published in BATTERY MAG, September issue

Design News

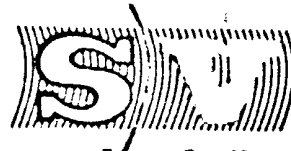


MARKET PROSPECTS Industry is under increasing duress to find ways to improve, but not only continuing to have regarding its product and market. The industry is under increasing duress to find ways to improve, but not only continuing to have regarding its product and market. The industry is under increasing duress to find ways to improve, but not only continuing to have regarding its product and market.

Full-page photo feature:
sheet lead sound barrier helps to
overcome noise problems encountered at
Northport, N.Y. plant of Long Island
Lighting Company -- capsule case history
published in DESIGN NEWS, September

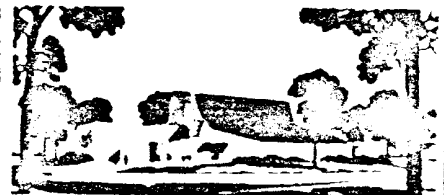
NOISEKPO Program
Open Plan Office Acoustics
Acoustical Privacy
Acoustical Windows
Architectural Products

September 1973



sound and vibration

Lead Roofing Specified for Sound Barrier



In the new Arts and Drama Center at Baldwin-Wallace College, Berea, Ohio, the architect and a certified acoustical consultant solved a potential noise problem with a lead roofed with 2.5 lbs. per square foot (Pb-25) sheet metal over steel. The sound transmission was improved because the Center is directly under a train as recorded by a seismograph using nearby Cleveland Hopkins Airport.

Baldwin-Wallace College, Berea, Ohio, a non-urban school with an enrollment of about 2,000 students, has a new Arts and Drama Center located close to a major air port. The architect and acoustical

consultant accommodated the potential noise problem by using sheet lead roofing as an additional sound barrier between aircraft noise and the theater building. The greenhouse theater has a 6 ft. high which runs high above

Article: "Lead Roofing Specified For
Sound Barrier"

Published in: SOUND AND VIBRATION

September, 1973



The entire roof of the Arts and Drama Center building at Baldwin-Wallace College is covered with sheet lead.

The structure, with its roof sloping up almost vertically from the rest of the building. The roof and the roof of the main theater are covered with 2.5 lbs. per square foot (Pb-25) sheet metal over steel. Underlayment in the roof consists of 18 lb. building felt over a wood deck. The felt was covered with 6 in. rigid insulation, then plywood, 20 lb. building felt, and paper and then the sheet lead. The lead is secured to battens with 16 oz. copper nails. Edges of the sheet are joined with loose bolts and clad with a non-hardening weathering compound to prevent the possibility of moisture entering the joints. Approximately 10,000 square feet of sheet lead were used on the Center's roof.

Circle 353 on Reader Service Card

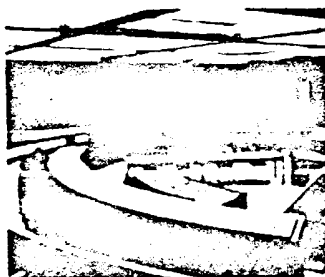
41-000 1000/1000
S.A.

AUG 1973

1000/1000

Lead is Widely Used in Quebec Justice Building

The Lead Industries Association has announced that the new Department of Justice Building for the Province of Quebec has made extensive use of sheet lead barriers for sound absorption within the building, not only in the heating and cooling system but also barriers between the nearly 80 court rooms in the Palais de Justice. Ervin Chert, a member of the Montreal firm of David and Boulet which designed the building, says that the Palais de Justice is a classic example of the variety of noise control techniques available to ensure that working areas in the building are as quiet as possible.



This view of one of the big courtrooms in the new Palais de Justice Building in Montreal shows the new lead in courtrooms. In addition to its planned modern design, the courtroom also features soundproofing achieved by using sheet lead at the top of the courtroom walls. (Photo courtesy of the Lead Industries Association.)

MOISE/1000

Article: "Lead Is Widely Used in Quebec
Justice Building"

Published in: MOISE/1000

August, 1973

PRODUCTION

ELITE PRODUCTION
MAGAZINE
Box 100

JUL 1973

ELITE
1000

LEAD FOAM HELPS MEET OSHA NOISE RULE
Lead foam panels are being used to build machinery enclosures and are helping manufacturers conform to the OSHA noise level regulations. According to the Lead Industries Association, Inc., such enclosures are capable of reducing noise transmission to 50 dB. However, the individual benefits gained are predicated on the enclosure's design and the quality of its installation.

Custom enclosures are being engineered by noise shielding experts for virtually every type of machinery regardless of size or configuration. Additionally, standard acoustical panels are available in 2 ft by 4 ft, 2 ft by 8 ft, and 4 ft square sizes for those who prefer to do-it-yourself. Standard panels are fitted with an extruded frame, adding to their rigidity and reinforcing their assembly.

A standard panel is composed of a 1½-in. thick lead foam sandwich, complete with an extruded aluminum frame. The panel's interior surface, which faces the shop area, is covered with an aluminum sheet ranging from .049 to .083 thick, adding strength to the structure.

The lead foam sandwich consists of two ½ in. (0.078 thick) lead sheets bonded to acoustical foam. The foam material meets the UL-94 regulation for fire retardancy and will not "drip out" or disintegrate from the lead sheet. Another feature of the foam material is its self-healing characteristic. For example, the foam material extrudes electrical conduits or similar accessories retained through drilled holes in the panel and thereby eliminates potential noise

See article: Lead/Foam Helps Meet
OSHA Noise Rule --- Published in
PRODUCTION magazine, July issue

Piezoelectric ceramics: novel engineering materials

Piezoelectric ceramics will expand and/or contract when voltage is applied, produce electricity when pressure is applied. A wide range of products make use of this phenomenon.

by John A. Vossard, Executive Editor

Piezoelectricity is often referred to as "pressure electricity." A piezoelectric material will change its shape when voltage is applied and, conversely, will produce electricity when pressure is applied. This phenomenon, a property of certain crystals such as quartz, Rochelle salt, barium titanate and various ceramics, notably barium titanate and lead zirconate-titanate (PZT) compositions, has been put to use in a number of solid-state electro-mechanical and electro-optic devices. Applications for piezoelectric ceramics are shown in Table I.

Piezoelectric ceramics are polycrystalline in nature and are not piezoelectric in their original state. Piezoelectric behavior is induced in these materials by a polarizing treatment. The materials are produced by: 1) sintering mixing oxides and additives; 2) drying; 3) pressing through a reaction furnace at a temperature about 200°C below the ultimate firing temperature; 4) ball milling to about 1-5 micron particle size; 5) adding binders; 6) pressing to desired shape; 7) firing; 8) machining or grinding, if required, to final dimensions; 9) applying electrodes, usually fired on silver; and 10) polarizing at 40-100 v/cm, usually a.c.

Piezoelectric actives

The deformation of a body of piezoelectric material which results by applying an electric field, and conversely, the nature of the deforming

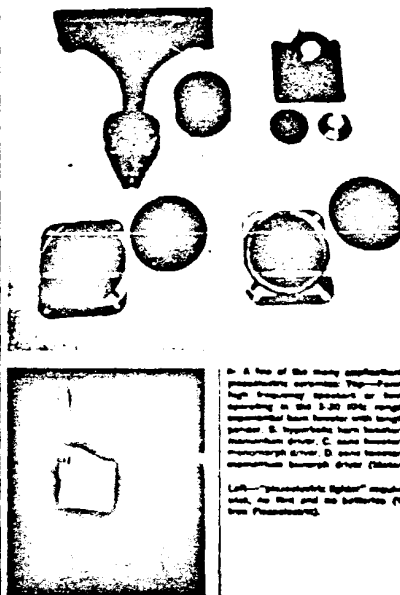


Fig. 1 is a list of the many applications for piezoelectric ceramics. Top: variety of high frequency resonators or transducers operating in the 1-20 MHz range. Bottom: piezoelectric actuators with length in microns. B: piezoelectric actuators with micrometer drive. C: piezoelectric actuators with micrometer drive. D: piezoelectric actuators with micrometer drive. (Continued)

Left: "Piezoelectric lighter" requires no spark, no flame and no batteries (Photo by Piezoelectric).

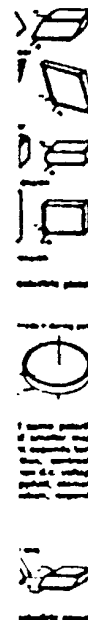


Table I
Applications for piezoelectric ceramics
1. Actuators
2. Transducers
3. Sensors
4. Relays
5. Switches
6. Amplifiers
7. Oscillators
8. Filters
9. Delay lines
10. Memory devices
11. Light sources
12. Laser components
13. Medical devices
14. Industrial components
15. Defense components
16. Aerospace components
17. Marine components
18. Power components
19. Signal processing components
20. Other components

30 Materials Engineering 8-78

1 applied, their output around an axis. 2. From "Piezoelectricity"

One Piece 12
From the Piezoelectric Series 12

Publicity resulting from editorial contact:

Feature on Piezoelectric ceramics
published in MATERIALS ENGINEERING

August issue.....three pages

S.I. METALWORKING
ON LINE

JUN 1973

LEAD-UP
PACING

METALS MARKETS

In general, the demand for base metals is a reliable indicator of the business conditions in an industrial nation. A strong economy means a strong demand for metals and firm prices, while weak metal prices are the result of a forecast and some economic outlook.

Canada stands among the leaders in mineral production, being the world's third largest mineral producer and the largest mineral exporter. The country ranks first in the production of nickel, silver, and zinc, second in platinum and copper, and third in aluminum, gold and lead. The United States is by far the largest consumer, followed by the European Common Market, and Japan. Canada's dependence on the U.S. market is best illustrated by table 1.

Although Canada is a major producer of metals, competition must sell their products on the world markets at world market prices. In the past, Canada has received only nominal influence on the world's commodity prices, with the possible exception of nickel.

Because the United States is the largest user of metals, it determines commodity prices. That is why the state of the economic health of the United States is of primary importance in any analysis of metal markets. A strong recovery has set in after the recession of late 1970, and the demand for metals, after the usual lag, seems to be in a strong upswing. The European Community and Japan are experiencing similar recoveries resulting in an even greater demand for metals.

The dramatic turnaround in the economic outlook and the demand for metals can be shown by examining the two metals that have been under most pressure in recent years, namely lead and zinc.

Last year, 1972, the Lead Industries Association (LIA) and Zinc Institute (ZI), held their annual convention in

Minerals. Chosen and despite was evident everywhere, with even the most optimistic delegates regarding that demand and prices in both commodities would decline. The reason for pessimism was overabundance, especially for the lead producers.

The year, 1973, the meeting was held in London, giving emphasis to their reliance on the automobile industry. The tone of the meeting was a complete contrast to last year. Leading confident lead was to be seen everywhere, with not a single pessimist in sight.

The prospects of doom were entirely wrong, but only lead demand rose, but prices were firm. What had brought about this miracle? To answer this we have to look at the breakdown of lead consumption.

Storage batteries	40%
Cumulative additions	22%
Cable covering	14%
Ammonia, zinc	6%
Others	18%

During the last several years there has been a trend in the automobile industry toward smaller and lighter cars. The also meant lighter and less bulky car batteries, which in turn meant a decrease in lead content of the batteries. Considering that 25% of total lead consumption would be affected by this changeover, sources of over supply and falling prices became commonplace. Very few expected improved demand and higher prices.

The unexpected did occur. In May 1973, the two biggest producers, St. Joe Minerals Corp. of New York, and American Smelting and Refining Company, increased the price of lead in the United States by half a cent a pound to 16.5 cents. Both companies cited improved demand from domestic consumers, particularly the automotive industry, as the reason for this action.

Statistics for the first part of 1973 seem to be in accordance with their claims. Retail sales of automobiles in the U.S. climbed to 862,112 in April, setting the seventh monthly record in a row. Motor vehicle output in Canada for the first four months has increased by 11.9 percent from 513,544 units to 574,681 units, with even greater weekly output scheduled for the immediate future.

The mounting pressure to conserve lead from producers was also of great concern to lead producers. After January 1, 1974, no producer in Canada may smelt more than 2.5 grams of lead per gallon. At present, producers consume up to 4 grams of lead per gallon. In the United States, the Environmental Protection Agency (EPA) requires that all major oil companies must have one lead-free gasoline by July 1, 1974. The plan was to have less than 1.25 grams of lead in all gasoline by 1977.

As so often happens, a crisis is pushed into the background by an even greater crisis. For years, the automobile, burning lead-based gasoline, has been singled out as a major polluter of our environment. Many people have gone on record as wanting to ban the automobile entirely. Now, with the dramatic emergence of the energy shortage, the specter of automobiles standing quietly in garages emitting no fumes at all, has become a possibility.

Suddenly everyone is concerned with conserving energy. There are two choices open, stop driving, or make every gallon go further mileage.

When faced with this choice, even the most ardent pollution problem admit that the modest addition of lead to gasoline, to give better mileage, is acceptable. The latest indications are that the EPA may not pass, after all, the proposed schedule as indicated above. Some reduction in lead in gasoline is inevitable, but if the schedule is

Table 1

COMMODITY	EXPORTS TO THE U.S. (% of total production)
Aluminum	95
Copper	23
Lead	27
Nickel	66
Zinc	46

Special publicity resulting from LIA
annual meeting
METALWORKING magazine, June

Metalworking - June, 1973

COMMERCIAL
CONSTRUCTION NEWS
WASHINGTON, D.C.
JUN 25 1973

Noise control is theme of LIA exhibit at convention

Washington, D.C. — Noise control is the announced theme of the Lead Industries Association, Inc. exhibit at the 25th Annual Construction Specification Institute Meeting to be held at the Sheraton Park Hotel, Washington, D.C., June 25-27.

The decision to feature noise control at the exhibit, according to

Philip E. Robinson, executive vice president of the trade association, stems from the number of Federal, State and local noise control regulations which create sound environmental problems that can be solved by lead sound barriers.

A highlight of the exhibit will be a portable and massive booth, an enclosure designed to measure the

power of hearing or the audibility or intensity of sounds. The booth, which has a sheet lead sound barrier in the walls and ceiling, is typical of the type being used by industry to test the hearing of employees exposed to high noise levels.

The exhibit will also feature samples of lead and lead-containing noise control products.

512 ARMY
BETH, BARRY
BET, CL, HIL, HIL, HIL
BETH, BARRY

JUN 25 1973

EXHIBIT
BACON

Lead Sound Barriers Theme Of Industry Exhibit This Week

NEW YORK — Noise control with lead sound barriers will be the theme of The Lead Industries Association, Inc. exhibit at the 25th Annual Construction Specification Institute meeting this week at the Sheraton Park Hotel, Washington, D.C.

The exhibit, in space No. 170-275, will feature samples of lead and lead-containing noise control products and will contain a portable and massive booth.

The enclosure, which has a sheet lead sound barrier in the walls and ceiling, is designed to measure the power of hearing or the audibility or intensity of sounds.

According to Philip E. Robinson, Association executive vice president, the decision to feature noise control at the exhibit is based on the fact that an increasing number of Federal, State and local noise control regulations are creating major sound transmission problems that can be best solved by lead sound barriers.

Of particular importance is the Occupational Safety and Health Act, which now places Federal limits on noise levels in about 6

million industrial plants that employ nearly 60-million workers.

Publicity announcing LIA booth
at 25th Annual Construction Specification
Institute Meeting in Washington, D. C.

Sheet lead's advantages for noise barriers

A publication on the practical application of sheet lead for sound barriers is intended to help both professional and do-it-yourselfers. Lead's mass, impedance and internal damping make it ideal for such use. It can be used in a number of ways to block noise—sheets in wall panels, curtains, laminated to plastics for enclosures or attached directly to heavy machinery. Language and definitions in the booklet are non-technical to help the layman. (Lead Industries Assoc.)

Circle 1 on Reader Service Card

41-23 INDUSTRY
NO. 438

AUG 1973

LEAD P
BOOKS

Lead sound barriers

The Lead Industries Association has announced the availability of a new publication, "Practical Application in Sheet Lead for Sound Barriers". The eight-page brochure is intended to help the professional as well as the do-it-yourselfer and the remodeler.

The book points out that lead is an effective sound barrier material because of three properties—mass, impedance, and internal damping. It can be used in a number of ways to block the path of sound—as sheets in wall panels, as curtains in a sound path, laminated to plastics for enclosures, attached directly to heavy machinery. Copies of the booklet can be obtained without charge from the Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017.

NOISE
CONTROL
NEWS

AUG 1973

Sheet Lead Noise Barriers

"Practical Application of Sheet Lead for Noise Barriers" contains a series of sketches of lead-bearing partitions or barriers in various situations. The series shows construction details. —Lead Industries Association, Inc.

Circle 2 on Reader Service Card

Air Quality Monitor

Brochure focuses on air quality monitor that provides continuous, accurate, real-time monitoring of particulate emissions and flow characteristics. For more details, contact the manufacturer. —Lead Industries Association, Inc.

Circle 3 on Reader Service Card

41-77 MACHINE
DESIGN
E.A.R. 12488

AUG 9 1973

LEAD P
BOOKS

Lead Barriers

Brochure helps the professional, the do-it-yourselfer, and the remodeler in applying lead as a sound barrier. Details include a series of sketches of lead-bearing partitions or barriers accompanied by text.



PLANT ENGINEERING
BARRIERS
E.A.R. 12488

AUG 9 1973

The natural superiority of lead as a sound barrier material is pointed up in a booklet on the practical application of sheet lead for the purpose. Prepared by the Lead Industries Association, this practical brochure contains sketches of lead-bearing partitions or barriers accompanied by text curves showing sound barrier capabilities of each type of construction. The sketches help you choose a barrier to fit your acoustic and economic needs. No charge. (Circle 3 on Post Card)

41-71 DESIGN NEWS
NO. 12488

AUG 20 1973

LEAD P
BOOKS

Sheet Lead for Noise Barriers

Brochure contains a series of sketches of lead-bearing partitions or barriers accompanied by text curves showing sound barrier capabilities of each type of construction. The architectural sketches will facilitate planning and enable users to choose a sound barrier to fit their needs. Lead Industries Association, Inc., 292 Madison Ave., New York, NY 10017.



PRODUCT ENGINEERING
NEW YORK, N.Y.
E.A.R. 12488

AUG 1973

Lead sound barriers. Brochure, 8 pp., from the Lead Industries Assoc. outlines uses and design details for lead sound barriers. Includes performance data. —Circle 2 on Reader Service Card

41-23 INDUSTRY
NO. 438

SEP 1973

LEAD P
BOOKS

Application brochure shows how to use sheet lead for sound barriers

Eight-page booklet describes how lead can be used to block sound passages. Besides showing applications, and test curves showing effect of different leads of construction using lead, list of materials needed for each type installation making time minimum. Lead Industries Association, 292 Madison Ave., New York, NY 10017.

Circle 4 on Reader Service Card

41-94 BOOKS/NEWS
E.A.R.

JUN 1973

LEAD P
BOOKS

Use of Lead in Sound Control

The Lead Industries Association, Inc. has published several items concerning applications of lead in sound control in the Spring 1973 issue of LEAD Magazine. Copies of the magazine can be obtained from the Lead Industries Association, Inc., 292 Madison Ave., New York, NY 10017.

Literature Availability Announcements

"Practical Applications of Sheet Lead for Sound Barriers"

Published in: NOISE/NEWS, DESIGN NEWS, IRON AGE, MACHINE DESIGN, INDUSTRIAL BOUQUIN NEWS, FOUNDRY, AND PLANT ENGINEERING

WELDING
JOURNAL
NEW YORK

JUL 1973

LEAD
MAGAZINE

Publications and Films

Publications distributed free of charge are listed in a 12-page booklet. Categories include soldering and welding, chemical construction and corrosion protection and cable sheathing.

Lead Industries Association 66

BUILDING DESIGN &
CONSTRUCTION
CHICAGO, ILL.
MONTHLY \$2.00

JUL 15 1973

Information material

Lead Industries Association has more than 50 various publications distributed free of charge to lead professionals for use in their own offices. These include technical papers, brochures, booklets, and films. The publications are listed by category under specific categories of lead and lead-containing products and applications. Literature Service Dept., Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017.

ADHESIVE
NEW YORK, N.Y.
MONTHLY \$2.00

JUN 1973

Publications and Films. This 12-page booklet lists more than 50 various publications distributed free of charge by the Lead Industries Association. The publications are listed by category under specific categories of lead and lead-containing products and applications. Literature Service Dept., Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017.

Lead Review. The Lead Industries Association, Inc., 292 Madison Ave., New York, N.Y. 10017 has announced publication of the 1973 Annual Review of the U.S. Lead Industry. The 20-page report available free from the Association, provides in-depth data on the production and consumption of lead in the United States and foreign countries. Data and graphs in the report provide a foundation for lead consumption to produce from 1968 through 1973. Also discussed is lead's increasing use in various fields for lead, a report on secondary production, a report on the free world lead situation, and on the lead development projects conducted by the International Lead Zinc Research Organization, Inc.

Annual of Lead Industry

Lead Review. The Lead Industries Association, Inc., 292 Madison Ave., New York, N.Y. 10017 has announced publication of the 1973 Annual Review of the U.S. Lead Industry. The 20-page report available free from the Association, provides in-depth data on the production and consumption of lead in the United States and foreign countries. Data and graphs in the report provide a foundation for lead consumption to produce from 1968 through 1973. Also discussed is lead's increasing use in various fields for lead, a report on secondary production, a report on the free world lead situation, and on the lead development projects conducted by the International Lead Zinc Research Organization, Inc.

CONSTRUCTION
OFFICE
BIRMINGHAM, B.C.
MONTHLY \$2.00

JUN 1973

Building applications

Applications of lead clad steel include bridges and wall covering. Design applications include roof covering, walling, ducts and exhaust equipment, gutters, expansion pipe, downspouts, and parapet covering. Frequently it was often overlooked to use lead for such applications because the lead normally requires structural support which the steel can supply.

For additional information write to Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017.

INDUSTRY
BOSTON, MASS.
MONTHLY \$2.00

AUG 1973

Lead sound barriers

The Lead Industries Association has announced the availability of a new publication, "Practical Application of Sheet Lead for Sound Barriers". The eight-page brochure is intended to help the professional as well as the do-it-yourselfer and the remodeler. The book points out that lead is an effective sound barrier material because of three properties - mass, impedance, and internal damping. It can be used in a number of ways to block the path of sound - as sheets in wall panels, as curtains in a sound path, laminated to plastics for enclosures, attached directly to motor machinery. Copies of the brochure can be obtained without charge from the Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017.

4157 PLUMB
TROMBONE
L.A. 2000

JUN 28 1973

LEAD
MAGAZINE

Knowledge of Electric Trade

Lead Review. The Lead Industries Association, Inc., 292 Madison Ave., New York, N.Y. 10017 has announced publication of the 1973 Annual Review of the U.S. Lead Industry. The 20-page report available free from the Association, provides in-depth data on the production and consumption of lead in the United States and foreign countries. Data and graphs in the report provide a foundation for lead consumption to produce from 1968 through 1973. Also discussed is lead's increasing use in various fields for lead, a report on secondary production, a report on the free world lead situation, and on the lead development projects conducted by the International Lead Zinc Research Organization, Inc.

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Code 100 to Post Lead

COMMERCIAL
CONSTRUCTION NEWS
HONOLULU, H.I.
MONTHLY \$2.00

JUL 1973

LEAD MAGAZINE

Lead magazine reviews 12 problem-solving applications involving lead. Among these is the use of sheet lead to solve some problems at a large electrical power plant. The contributions of sheet lead in safety applications are pointed up in two articles. Other articles discuss a unique training school for lead sheathed cable splicers, and a home that can help overcome the world-wide shortage of lumber by utilizing a design concept involving the extensive use of lead and zinc construction products. The magazine also has technical literature that is currently available. Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017.

Four examples of published literature

availability announcements:

- "Publications and Films"
- "Lead" magazine
- "Annual Review of Lead Industry"
- "Lift Profits Electrically"

6-4 ENGINEERING & MINING JOURNAL NO. 6, 1973

JUN 1973

LEAD INDUSTRIES ASSOCIATION

D. B. Craig has been re-elected president and chairman of the board of the Lead Industries Association, Inc. Craig is executive vice president of St. Joe Minerals Corp. LIA has also elected two new members to its board of directors: J. A. Mandick, vice president, Match Div., NL Industries, and R. H. Ramsey, vice president, Norwest Mining Corp.

6-7 PLANT & WAREHOUSE PRODUCTION NO. 6, 1973

JUL 1973

LEAD INDUSTRIES ASSOCIATION

Craig Re-Elected

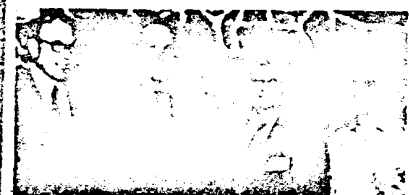
D. B. Craig, executive vice-president of St. Joe Minerals Corp., New York, N.Y., has been re-elected president and chairman of the board of directors of the Lead Industries Association, Inc.

At its 45th annual meeting held recently in Denver, Colo., T. M. Saylor (Elgin Corp.), J. F. Patterson (Elgin Corp.) and J. G. McCullough (Ames Lead & Zinc) were re-elected vice-presidents of the Association. L. E. Gage, director of communications for LIA, was elected to the additional post of assistant secretary. Other officers re-elected by LIA were P. E. Robinson, executive vice president; J. F. Smith, secretary and general manager; R. J. O'Hara, treasurer; and D. L. Moore, comptroller and assistant treasurer.

6-4 ENGINEERING & MINING JOURNAL NO. 6, 1973

JUN 1973

LEAD INDUSTRIES ASSOCIATION



Raymond Ramsey Shepard Taylor

Association officers...

Executive Vice President: D. B. Craig, St. Joe Minerals Corp., New York, N.Y. President: D. B. Craig, St. Joe Minerals Corp., New York, N.Y. Secretary and General Manager: R. J. O'Hara, Norwest Mining Corp., New York, N.Y. Treasurer: D. L. Moore, Norwest Mining Corp., New York, N.Y. Comptroller and Assistant Treasurer: D. L. Moore, Norwest Mining Corp., New York, N.Y.

Vice President: J. F. Smith, Elgin Corp., New York, N.Y. Vice President: J. G. McCullough, Ames Lead & Zinc, New York, N.Y. Vice President: J. A. Mandick, Match Div., NL Industries, New York, N.Y. Vice President: R. H. Ramsey, Norwest Mining Corp., New York, N.Y.

6-7 BATTERY MAN NO. 6, 1973

JUN 1973

LEAD INDUSTRIES ASSOCIATION

LEAD INDUSTRIES ASSOCIATION

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It was also announced that J. A. Mandick, vice president, Match Div., NL Industries and R. H. Ramsey, vice president, Norwest Mining Corp., were added as new members to the Board of Directors of LIA.

6-8 STEEL ENGINEERING NO. 6, 1973

JUN 1973

LEAD INDUSTRIES ASSOCIATION

John T. Boyd has been elected chairman and chief executive officer of John T. Boyd Co. Boyd & Frantz, formerly vice president, succeeded Boyd as president and Anne W. Boyd has been named assistant to the president.

D. B. Craig, executive vice president, St. Joe Minerals Corp., has been re-elected president and chairman of the board of directors of the Lead Industries Association, Inc.

THE BATTERY MAN June 1973

WHO WHAT WHERE

LEAD INDUSTRIES ASSOCIATION

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It was also announced that J. A. Mandick, vice president, Match Div., NL Industries and R. H. Ramsey, vice president, Norwest Mining Corp., were added as new members to the Board of Directors of LIA.

6-3 WELDING ENGINEER NO. 6, 1973

JUL 1973

LEAD INDUSTRIES ASSOCIATION

LEAD INDUSTRIES ASSOCIATION, INC. — The Board of Directors of this corporation added the following to their membership: J. A. Mandick, vice president, Match Div., NL Industries and R. H. Ramsey, vice president, Norwest Mining Corp., both of New York.

Lead Industries Personnel Announcements...

Craig, Mandick, Ramsey, Robinson, Gage, Saylor, Pittenhouse, McCullough, Smith, O'Hara, and Moore

ENGINEERING & MINING JOURNAL, PLANT & WAREHOUSE PRODUCTION, MATERIAL HANDLING ENGINEERING, BATTERY MAN, MINING ENGINEERING AND WELDING ENGINEERING