Lead Industries Association, Inc.
292 Madison Avenue • New York, N.Y. 10017 • Telephone: (212) 578-8030

December 21, 1973

SUBJECT: FOURTH QUARTERLY PUBLICITY REPORT

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

Attached for your review and comment is a report on LIA Fourth Quarterly Publicity activities. A summary of the number of feature articles and other placements appears on Page 7. We are proud of the continued success of this effort, being conducted through our agency, Lieberman Harrison, and if you should wish a few additional copies of this report for distribution, please let us know.

One additional pickup which we did not have time to attach has also been enclosed. This was a feature article appearing in "Transport Topics" which has a weekly circulation of 26,000 and is directed to truckers through the American Trucking Association. The electric postal delivery van featured in this article is very similar to the lead-acid battery powered van which your Association has purchased and will have on display around the country in 1974.

Sincerely,

Jerome F. Smith

JFS:lm
Enclosures

Jerome F. Smith
Secretary & General Manager

4-116 TRANSPORT
TOPICS
WKLY. 26,000

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Postal Service Testing Electric Delivery Vehicles

The more than 100,000 internal combustion engine-powered U.S. Postal Service mail delivery trucks may eventually be replaced by fleets of electrics at a rate of 5,000 vehicles per year.

That's what could happen if tests now being conducted in the Eastern United States and in California prove that lead acid battery-powered vehicles can deliver the mails more quietly, efficiently, and with far less energy consumption that internal combustion-powered vehicles.

One U.S. Postal Service official estimates that the initial vehicle replacement program would begin with about 3,300 electric vehicles per year and then, as production facilities expand—and providing the electric vehicles continue proving themselves—the replacement rate could increase to about 5,000 electrics per year.

The U.S. Postal Service is funding tests of such vehicles in Cupertino and Santa Ana, Calif.; Allentown and Bethlehem, Pa.; and Lowell, Mass.

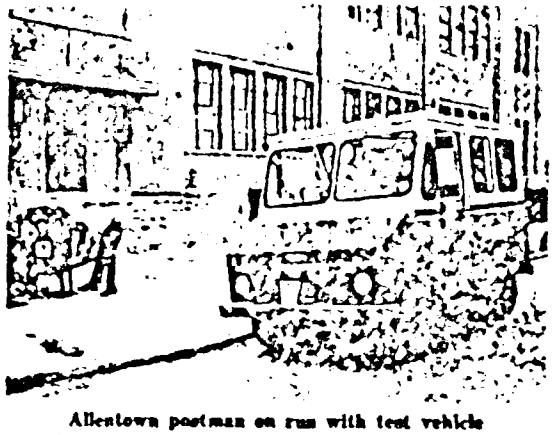
'Very Comfortable'

Allentown mail carrier Frank Wetherhold is piloting a new, all-electric, lead acid battery-powered truck which he says is "very comfortable to handle and drive."

Allentown postal supervisor Richard Truxell says the significant factor, in addition to absence of pollution, is that the battery-powered carrier route less to operate. About 15 kilowatt hours are needed to power one electric car for a 10-to-12-mile route. A mounted carrier route in Allentown averages about 30 miles per day.

The Allentown electric unit is manufactured by Battronic Truck Corp., Buyertown, Pa., which also is producing 100 on-the-road electric vehicles as part of a million-dollar nationwide testing program funded by 55 electric utilities.

The Lead Industries Assn. says the vehicle Battronic is supplying at Allentown is powered by a 96-volt lead acid battery with a top speed of 47 mph.



Allentown postman on run with test vehicle

Three more battery-powered electric vehicles are scheduled to be tested at Allentown. Three similar vehicles are slated to be tested at Bethlehem, Pa.

California Plans

In Cupertino, Calif., plans are being made for full-scale electrification of the town's mail delivery service as the result of a two-year test of electric vehicles for intracity mail delivery. Thirty electric vehicles, also powered with lead acid batteries, are slated to replace the standard internal combustion vehicles.

Cupertino Postmaster Alvin R. Carter claims that the electric trucks are smog-free and cost only about one-tenth as much as the conventional type to operate. The electrics can reportedly operate for at least two days without recharging. When a recharge is necessary, the batteries are connected into an industrial-type charger. The trucks have a top speed of 40 mph on a 2% upgrade and are powered by two, 36-volt lead acid batteries.

Don P. Crane, director, Office of Fleet Management at postal headquarters in Washington, D.C., feels that if the 30 vehicles are successful, this may lead to their introduction in several other "sun belt" cities such as Phoenix, Miami, Memphis and Los Angeles. These cities are called ideal because they are not too hilly, and their warm climate is suitable for year-round electric vehicle operation.

Transportation Systems Laboratory is supplying the vehicle for the Lowell tests. In California, a combination U.S.-British vehicle will be used for the 30 prototypes for the Cupertino "ElectroMail" project. Harbilt Electric Vehicle Co., Manchester, England, has been awarded a contract to build the electric propulsion system for the vehicle and it will be completed and assembled by Electric Vehicles, San Francisco.

The vehicle being tested in Santa Ana is designed and manufactured in the Stockton, Calif., Special Vehicle Plant of the Otis Elevator Co. The vehicle has been tested by Dynamic Science Laboratories, an independent testing facility located in Phoenix, Ariz.

The Otis Electric Delivery Vehicle can travel about 40 miles on a single charge and has a maximum speed of 42 mph. Sixteen 6-volt lead acid batteries power the vehicle.

In the tests at Lowell, an electric delivery van produced by the Transportation Systems Laboratory, is being used.

The five-city electric vehicle mail delivery project is designed to test various types of vehicles under various conditions, and to determine the ability of manufacturers to produce electric-powered vehicles that will meet the U.S. Postal Service's need.

December, 1973

LEAD INDUSTRIES ASSOCIATION
TRADE PUBLICITY PROGRAM
FOURTH QUARTER
October-December, 1973

In addition to the publicity projects listed below, an extensive publicity and promotion program was developed for the introduction of the nation's first modern-day production-line electric vehicle by the Lead Industries Association. Named GoLIAth, the vehicle is slated to be introduced to the press and public on January 16, 1974, at the Plaza Hotel in New York City. The program includes a variety of publicity materials which will be directed to the trade press, daily newspapers, news magazines, radio and television; and promotion material directed to various commercial and industrial markets who are expected to purchase such vehicles.

Highlights of current publicity projects during this period include applications in...LEAD ACID BATTERIES:

* Three major feature articles on the use of lead acid battery-powered vans by the U.S. Postal Service appeared in ELECTRICAL WORLD, AMERICAN METAL MARKET, and ELECTRIC VEHICLE NEWS.

* A feature article on OSHA's approval of battery-powered vehicles for hazardous areas appeared in ELECTRIC VEHICLE NEWS.

* A photo caption article on the use of lead acid batteries to operate the hydraulic lift mechanism on a truck-mounted aerial lift bucket was published in ELECTRIC VEHICLE NEWS.

During this period two releases discussed the use of lead in sound control. One release discussed lead used to reduce industrial noise in machinery enclosure panels, a plastic scrap grinder and, a centrifugal compressor. The second release discussed how Grumman Corporation utilized leaded vinyl to reduce noise levels in its Gulfstream II executive jet and in the experimental tracked air cushion research vehicle (TACRV) the company built for the Department of Transportation.

* A feature article combining the three industrial applications and Grumman's jet aircraft and TACRV applications appeared in PRODUCT ENGINEERING.

* A feature article on the three industrial noise applications appeared in FACTORY.

* A feature article on the two Grumman noise control applications appeared in AMERICAN METAL MARKET. A short notice on this same application was also published in TECHNICAL SURVEY.

* A photo caption article on the use of lead in the plastic scrap grinder appeared in MACHINE DESIGN.

Other releases published during this period included:

* A feature article on the use of LEAD ALLOY SOLDER PREFORMS to simplify the soldering of metals appeared in CIRCUITS MANUFACTURING, INSULATION CIRCUITS and DESIGN NEWS.

* A feature article announcing the introduction of a new LEAD CLAD STEEL composite material in England appeared in ABC AMERICAN ROOFER & BUILDING CONTRACTOR. A short notice on this subject also appeared in TIN INTERNATIONAL.

* A feature article describing the unearthing of a 200-year old lead fragment from an equestrian statue of King George III appeared in CASTING ENGINEERING.

* A release announcing the Second International Soldering Conference, sponsored jointly by the Lead Industries Association and the American Welding Society appeared in WELDING JOURNAL.

J. A. Peterson's paper, "Lead In Automobile Industry's Batteries", presented at the LIA Annual Meeting, was published in AUTOPRODUCTS Magazine.

* A feature article by-lined by LIA executive vice-president, Philip Robinson on the use of highway yellow

chromate paint as part of a nationwide highway safety plan appeared in AMERICAN PAINT JOURNAL CONVENTION DAILY. This publication appears at the annual meetings of the National Paint and Coatings Association and the Federation of Societies for Paint Technology.

Five LITERATURE AVAILABILITY announcements appeared in a wide variety of magazines during the reporting period. The announcements included the following:

* "Annual Review of Lead Industry"
* "Practical Application of Sheet Lead For Sound Barriers"
* "Lead Magazine"
* "Lead Radiation Shielding"
* "Publications and Films"

LIA participation in a number of industry-related projects such as: Hofmann Memorial Prize Competition, Electric Vehicle Exposition, and a conference of childhood lead poisoning received publicity in several publications.

A number of other feature articles are scheduled for publication in the near future. These include:

* The use of sheet lead to line pollution control equipment at a Canadian copper mine will appear in a future issue of NORTHERN MINER.

* An article on lead acid batteries that provide uninterruptible power for IBM's computer headquarters is scheduled to appear in THE BATTERY MAN, ELECTRICAL WORLD and MODERN OFFICE.

* An article discussing Consolidated Edison's Cable Splicing School, and how trainees learn to join, splice and wipe underground electric cables is slated to appear in a future issue of WELDING DESIGN & FABRICATION.

* The use of lead in Nondestructive testing at a sand casting foundry is scheduled to appear in CASTING ENGINEERING.

* Additionally, the article discussing the Postal Service's use of battery-powered vans will also appear in FLEET OWNER.

Feature articles covering a wide variety of lead applications are currently being developed. Some of these include:

* The use of lead-tin-silver bonding preforms in new electronic automobile ignition systems.

* Lead-based paints used to repaint the Brooklyn Bridge for its 90th Anniversary.

- A new copper/lead anti-friction compound for metalworking applications.
- Sheet lead utilized to damp noise on a centrifugal blower; and at Chrysler Corporation to reduce noise on high velocity fans, ducts, and a centrifugal compressor.
- Lead acid batteries used to store electricity for a unique house that operates by solar energy.
- LIA's newly acquired electric work vehicle, GoLIAth.

FOURTH QUARTER
SUMMARY OF PUBLICITY ACTIVITIES

Feature Articles Published	13
News Articles Published (including literature availability announcements)	20
Feature Articles in Preparation	12
News Releases Completed (including personnel announcements and literature availability announcements)	11
Editorial Request Responses	9

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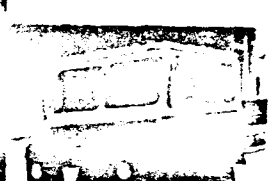
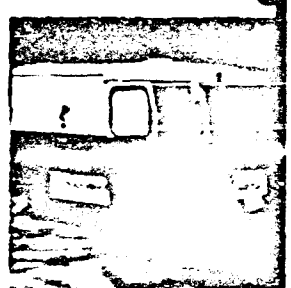
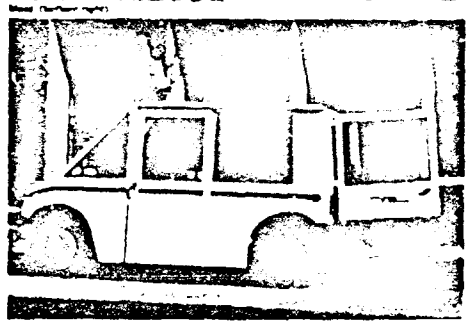
ENERGY [illegible]

Electrics get key Post Office tests

Results to date indicate that electric vehicles can handle the mail
One California town moves to fleet testing as Postal Service
funds testing programs in other sections of the country







Feature article: "Electrics Get Key
Post Office Tests"
Published in: ELECTRICAL WORLD
November 1, 1973

Table I: Calculated vehicle averages, Cupertino, Calif.

	Model Oct. 1, MPL to April 14, 1978	Jeep Nov. 87, MPL to March 28, 1978	
		Run #1	Run #2
Cost/mile	8.8¢	8.8¢	8.2¢
Energy use	1.2 kwhr/mile (28 mi./gal equivalent)	6.8 miles/gal (0.1 kwhr/mi. equivalent)	7.0 miles/gal (0.7 kwhr/mi. equivalent)
Miles/day	12.1	13.4	14.4 miles/day
Cost/day	97.2¢	88.4¢/day	74.8¢/day
Energy use	1.8kw/hour	36.7¢/gal	36.7¢/gal

lony-powered truck to deliver the mail in the city's 14th Ward. Unlike the internal-combustion-engine (ICE) vehicle it replaces, the electric truck is, says Weitzenfeld, "very comfortable to handle and drive." He adds that the vehicle is smooth-operating, and the absence of a hot engine results in a much cooler cab.

Allentown's Postal Service supervisor, Richard Tarnoff, says the signals are better, in addition to its being preferred driver, is the fact that the battery-powered carrier costs less to operate. About 15 kwhr are needed to power one electric unit for a 10-to-12 mile route. A conventional carrier route in Allentown averages about 30 miles a day, which is three times the national average and well within the capabilities of the electric vehicle.

The electric vehicle being tested in Allentown is manufactured by Battronics Truck Corp., Bensenville, Pa., the nation's leading producer of electric vehicles. (Battronics also is producing 300 on-the-road electric vehicles as part of a multimillion-dollar nationwide testing program funded by 33 electric utilities under the sponsorship of the Electric Vehicle Council.)

The Local Industries Association reports that the vehicle Battronics is supplying for the Allentown test is powered by a 36-v lead-acid battery, and has a top speed of 45 mph. Plans call for testing the vehicle on a variety of routes in Allentown. Carriers operating the vehicle will be asked to rate its performance at the end of the annual test period.

As part of the test program, three additional battery-powered vehicles are scheduled to be tested in Allentown. And three similar vehicles will be tested at nearby Bethlehem, Pa.

Cupertino test

In Cupertino, plans are being made for full-scale discontinuance of the town's mail-delivery service at the result of a two-year test of electric vehicles for delivery mail delivery. Thirty electric vehicles powered by lead-acid batteries are slated to replace the standard ICE-powered vehicles that now operate Cupertino's present mail-delivery fleet.

A combination U.S.-British vehicle will be used for Cupertino's "Electric Mail" project. Hewlett Electric Vehicle Co. Manchester, England, built the vehicle's electric propulsion system, and the vehicle was assembled and assembled by San Francisco-based Electric Vehicles Inc.

Cupertino Postmaster Alvin R. Carter says the trucks are strong-fast, and can easily almost one-tenth as much as the conventional type to operate. The electric can operate for at least five days without recharging the batteries, he says. When a recharge is necessary, the batteries are simply connected into an industrial-type charger. The trucks are powered by nine 36-v lead-acid batteries, and have a top speed of 40 mph on a 2% upgrade. However, they will travel at a maximum of 35 mph to conform with local speed laws.

The almost-silent vehicles produce only a slight hum as they accelerate, moving quiet early-morning deliveries. And since they draw power only when in motion, pedestrians from an idling engine is eliminated, and only the power needed to operate the vehicle is used, thus saving special personnel, he adds.

The test vehicle has now been in operation at Cupertino for a little over two years and it has been utilized on the same routes as the regular Post Office vehicles. The length of these routes ranges from 8 to 15 miles with 100 to 300 stops.

During the tests, daily mileage, power consumptions, the number of stops, and general maintenance records have been recorded (see Table I). In order to give these data some sort of perspective, a control vehicle was selected at random—a jeep powered by a four-cylinder engine—and comparative data were recorded. The overall results of the battery vs ICE comparison proved that these mail-delivery vans powered by batteries would be operated at the cost of operating one ICE vehicle.

Reaction to the vehicles by Cupertino postal workers who operate them has been generally favorable. One carrier commented that she feels better at the end of the day because the electric generates vibration and noise.

Don P. Crane, director of the Office of Fleet Management at postal headquarters in Washington, D.C., feels that, if the 30 vehicles are successful, it may lead to their introduction in several other "test beds" cities, such as Phoenix, Memphis, and Los Angeles. These cities are ideal, he says, because they are not too hilly and, in addition, their warm climates is suitable for year-round operations of electric vehicles.

Other tests

The vehicle being tested in Santa Ana is designed and manufactured in the Berkshire (Calif.) Special Vehicle Plant of Otis Elevator Co. The vehicle has been tested by Dynamic Science Laboratories, an independent testing facility in Phoenix, Ariz., which says it meets all specifications set forth by the Postal Service under its electric-vehicle test program.

The van, called the Otis Electric Delivery Vehicle, can travel about 40 miles on a single charge, and has a maximum speed of 45 mph. It mates 6-v lead-acid batteries power it.

Since the middle of June, the Otis vehicle has been driven on regular mail routes in the Santa Ana area. Morton Ordbert, postmaster of Santa Ana and assistant-district manager of the Orange County Postal Dept., sees the vehicle as the forerunner of the type of vehicle that will eventually be used on all routes in Orange County. Of the 1,900 routes in the county, 1,000 require vehicles to distribute mail.

The tests at Lowell began in late September. An electric delivery van provided by the Transportation Systems Laboratory, a division of Environmental, Bedford, Mass., is being used.

The vehicle, 2 ft shorter than a Volkswagen sedan, has 75 cu ft of cargo space for a 6-hour period, and a somewhat bigger than the present Postal Service Jeep. The Electrovan vehicle has a top speed of 45 mph and a range of 35 miles before its pack of 36 6-v batteries have to be recharged.

Maintenance is expected to consist solely of replacing the 950-lb battery pack every 10,000 to 20,000 miles, a once-a-month check on the water level in the batteries, and a periodic replacement of the motor brushes.

Costing $6,800 each, the electric vans are about twice as expensive as the conventional Jeeps, but are expected to last 15 years against the six-year life expectancy of a Jeep.

At present average electric rates, the electric van is estimated to operate at a cost of 3¢ a mile, vs about 24¢ for an ICE-powered vehicle. ●

DAILY NEWSPAPER – AIR DISPATCH

AMERICAN METAL MARKET

batteries section

Mail Delivery Vehicles Powered by Batteries On Replacement Horizon

NEW YORK – The more than [illegible] internal-combustion-engine-powered United States Postal Service mail delivery trucks may eventually be replaced by fleets of electrics at a rate of 1,000 vehicles per year. That's what could happen if tests now being conducted in the Eastern United States and in California prove that lead acid battery-powered vehicles can deliver the results more quickly, efficiently and with far less energy consumption than internal combustion-powered vehicles.

One U.S. Postal Service official estimated that the initial vehicle replacement program would begin with about 1,000 electric vehicles per year and then as production facilities expand – and providing the electric vehicles continue proving themselves – the replacement rate could increase to about 5,000 electrics per year.

As an indication of the Postal Service's serious interest in evaluating the electric postal delivery van concept, it is leasing some of such vehicles in Claremont, near San Jose, in Northern Calif., in Santa Ana, near Los Angeles, in Southern Calif., in the Eastern U.S. at Allentown and Bethlehem, Pa., and in Lowell, Mass., near Boston.

The tests are already under way at Claremont, Santa Ana, Lowell, and Allentown, and they are slated to begin shortly at Bethlehem. As part of the tests, Allentown mail carrier Frank Weiherhold is piloting a new, all-electric lead acid battery-powered truck to deliver the mail in the city's 16th Ward. The electric truck is, according to Weiherhold, "very comfortable to handle and drive." He added that the vehicle operates [illegible] and the absence of a [illegible] results in a smooth [illegible] in which to drive. "[illegible]'s Postal Service Richard Tressel, said [illegible] in advance of the battery-powered [illegible] test to operate [illegible] hours are saved [illegible] one electric car on a [illegible] route. A standard route in Allentown [illegible] about 20 miles per day. [illegible] time the national [illegible] Testing Program [illegible] electric mail carrier being [illegible] Bantamite was manufactured [illegible] Electronic Truck Corp. [illegible] Pa. Bantamite also is [illegible] 100 on the road electric [illegible] a part of a million-dollar [illegible] testing program funded by 18 electric utilities under the sponsorship of the Electric Vehicle Council (EVC).

Lead Industries Association (LIA) reported that the vehicle Bantamite supplied for the Allentown test is powered by a 48-volt lead acid battery and has a top speed of 47 mph. Plans call for testing the vehicle on a variety of routes in Allentown. Carriers operating the vehicles will be asked to rate its performance at the end of the initial test period.

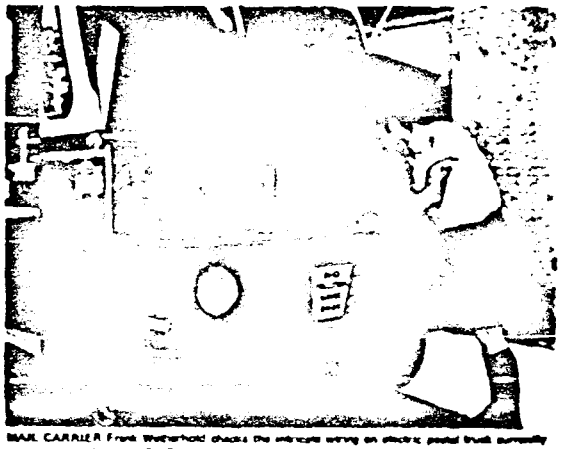
As part of the test program, three more battery-powered electric vehicles are scheduled to be tested at Allentown, and three more are slated to be tested at nearby Bethlehem.

Meanwhile in Cupertino, plans are being made for full-scale electrification of the town's mail delivery service as the result of a two-year test of electric vehicles for intra-city mail delivery. Three electric vehicles, also powered with lead acid batteries, will replace the standard internal combustion vehicles that comprise Cupertino's present mail-delivery fleet.

Being Free and Cheaper

Cupertino Postmaster Alvin R. Carter claimed that the trucks were being free and cost about one-tenth as much as the conventional type to operate. The electrics can operate for at least two days without recharging the batteries. When a recharge is necessary, the batteries are simply connected into an industrial-type charger. The trucks have a top speed of 40 mph on a 3 percent upgrade and are powered by two 36-volt lead acid batteries. They will travel at a maximum of 35 mph to conform with Cupertino speed laws.

[illegible] almost silent vehicles



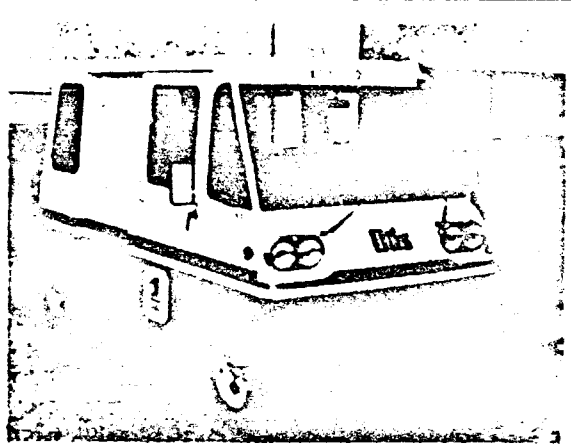
MAIL CARRIER Frank Weiherhold checks the [illegible] serving on electric postal truck currently under test in Allentown, Pa. The electric mail carrier is manufactured by Battronic Truck Corp., Bantamite, Pa., and is powered by a 48-volt lead acid battery.

This article was prepared for this Special Section by the Lead Industries Association, Inc., New York.

Feature article: "Mail Delivery Vehicles Powered By Batteries On Replacement Horizon"

Published in: Special Batteries Supplement, AMERICAN METAL MARKET

November 21, 1973



A LEAD ACID battery-powered vehicle produced by Otis Elevator Co.'s General Vehicle plant, Bristow, Calif., is being used to test the feasibility of electric mail service runs at Santa Ana, Calif.

Electric Vehicles To Speed Mail

(Continued from page 16)

operate them was generally favorable. One carrier commented that she felt better at the end of the day because the electrics maintained velocities of about

Don P. Crane, director, Office of Fleet Management at postal headquarters in Washington, D.C., feels that if the 30 vehicles are successful, more may be introduced in several other test fleets such as Phoenix, Miami, Memphis and Los Angeles. These cities are ideal because they are not too hilly and, in addition, their warm climates is suitable for year-round electric vehicle operations.

According to LIA, in addition to the vehicles Baltimore Truck Corp. is supplying for the Allentown and Bridgeton tests, Transportation Systems Laboratory is supplying one for the Lowell tests. In Colchester, a modification of U.S. Bristol vehicle will be used for the 30 prototypes for the Copenhagen "Electrobil" project. Berkeli Electric Vehicle Ltd. Manchester, England, has been awarded a contract to build the electric propulsion system for the vehicle, and it will be manufactured and assembled by Electric Vehicles, Inc., San Francisco.

The vehicle being tested in Santa Ana was designed and manufactured in the Bristow, Okla., special vehicle plant of the Otis Elevator Co. The vehicle was pre-tested by Dynamic Science Laboratories, an independent testing facility located in Phoenix, which said it meets all specifications set forth by the Postal Service under its Electric Vehicle Program.

Called the Otis Electric Delivery Vehicle, the van can travel a distance of about 60 miles on a single charge and has a maximum speed of 45 mph. Service break load and performance proved the vehicle.

Since the middle of June, the Otis vehicle has been driven on regular mail routes in the Santa Ana area. Marion Cardwell, postmaster of Santa Ana and sectional center manager of the Orange County Postal Department said he sees the vehicle as the forerunner of the type of vehicle that will eventually be used on all routes in Orange County. Of the 1,300 routes in the county, 1,300 require vehicles to distribute mail.

In the tests at Lowell, an electric delivery van produced by the Transportation Systems Laboratory, a division of Electrovision, Inc., Bedford, Mass., is being used for the project.

The three-city electric vehicle mail delivery project is designed to test various types of vehicles under various conditions, and to determine the ability of manufacturers to produce electric-powered vehicles that will meet the U.S. Postal Service's need. It is expected that, in time, a standard U.S. Postal Service electric mail truck will be developed.

product only a whine from its tiny accelerator, listening quiet deliveries. And users they drive cannot only where to motors, the cost and problems of an failing engine is eliminated.

The test vehicle has been in operation at Copenhagen for a little over a year, and has been utilized on the same routes as the regular Post Office vehicles. The length of these routes ranges from 4 to 8 miles, with 300 to 500 stops.

During the tests in Copenhagen, daily mileage, power consumption, the number of stops and general maintenance readings were recorded. To give the data some perspective, a control vehicle was selected at random — a Jeep powered by a four-cylinder internal combustion engine — and comparative data was recorded. The overall results of the battery vehicle versus the internal combustion powered vehicle study were good. Dual load, dual delivery were proved by lead acid batteries could be operated for the cost of operating one internal combustion vehicle.

Favorable Reaction

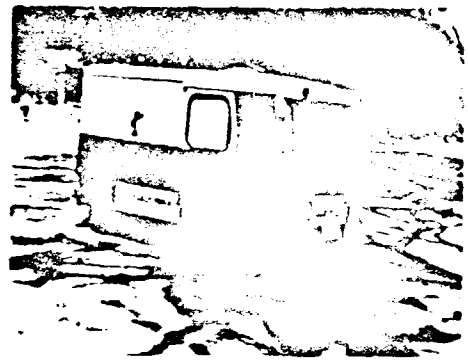
Reaction to the vehicles by Copenhagen postal workers who

(Continued on page 17)

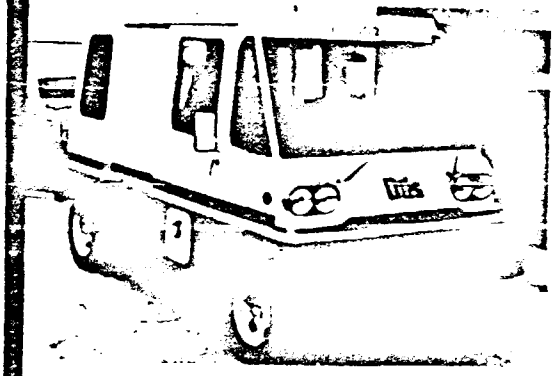
LIA15172

Postal Service Plugging Into EV Mail Delivery

The more than 160,000 internal combustion engine-powered U.S. Postal Service mail delivery trucks may eventually be replaced by fleets of electrics at a rate of 5,000 vehicles per year. That's what could happen if tests now being conducted in the Eastern United States and in California prove that lead acid battery-powered vehicles can deliver the mails more quietly, efficiently, and with far less energy consumption than internal combustion-powered vehicles. One U.S. Postal Service official estimates that the actual vehicle replacement program would begin with about 3,300 electric vehicles per year and then, as production facilities expand and proving the electric vehicles continue



HARBILT EV



OTIS EV

proving themselves—the replacement rate could increase to about 5,000 electrics per year.

As an indication of the U.S. Postal Service's serious interest in evaluating the electric postal delivery van concept, it is funding tests of such vehicles in Cupertino, near San Jose in Northern California; in Santa Ana, near Los Angeles in Southern California; in the Eastern U.S. at Allentown and Bethlehem, Pennsylvania; and in Lowell, Massachusetts, near Boston.

The tests are already underway at Cupertino, Santa Ana and Allentown and they are slated to begin very shortly at Bethlehem and Lowell. As part of the tests, Allentown, Pa., mail carrier Frank Weichenhold is piloting a new, all-electric, lead-acid battery-powered truck to deliver the mail on the city's 16th Ward. Unlike the internal combustion vehicle it replaces—the electric truck is, according to Weichenhold, quieter, smoother and more responsive. Weichenhold says that he also prefers the electric because it is easier to drive.

ELECTROMOTION VAN

The Allentown vehicle is powered by a 96-volt lead-acid battery and it has a top speed of 47 mph. Plans call for testing the vehicle on a variety of routes in Allentown. Carriers operating the vehicles will be asked to rate its performance at the end of the initial test period.

As part of the test program, three more battery-powered electric vehicles are scheduled to be tested at Allentown. Three smaller vehicles are slated to be tested at nearby Bethlehem, Pa.

Meanwhile, in Cupertino, Calif., adjacent to San Jose, plans are being made for full-scale electrification of the town's mail delivery service as the result of a two-year test of electrics slated to replace the standard internal combustion vehicles that comprise Cupertino's present mail delivery fleet.

Cupertino Postmaster Alma R. Carter claims that the trucks are smog-free and cost only about one-tenth as much as the conventional type to operate. The electrics can operate for at least two days without recharging the batteries. When a recharge is necessary, the batteries are simply connected into an industrial-type charger. The trucks have a top speed of 40 mph on a two per cent upgrade and are powered by two, 36-volt, lead-acid batteries. However, they will travel at a maximum of 35 mph to conform with Cupertino speed laws.

The all-new silent vehicles produce only a slight hum as they accelerate, assuring quiet, early-morning deliveries. And since they draw power only when the vehicle is in motion, the cost and pollution of an idling engine is eliminated.

The test vehicles have been in operations at Cupertino for a little over a year and it has been attributed on the same routes as the regular Post Office vehicles. The length of these routes ranges from 8 to 15 miles with 180 to 300 stops.

During the tests in Cupertino, daily mileage, power consumption, the number of stops and general maintenance readings have been recorded. In order to give these data some sort of perspective, a control vehicle was selected at random—a jeep powered by a four cylinder, in-

ternal combustion engine—and comparatory data were recorded. The overall results of the battery versus internal combustion-powered vehicles study proved that four mail delivery vans powered by lead acid batteries could be operated for the cost of operating one internal combustion vehicle.

Reaction to the vehicles by Cupertino postal carriers who operate them is generally favorable. One carrier commented that she feels better at the end of the day because the electrics eliminate vibration or noise.

Don P. Crane, Director, Office of Fleet Management at postal headquarters in Washington, D.C., feels that if the 30 vehicles are successful, they may lead to their introduction in several other "non-belt" areas

Product Engineering

Design engineering feature

Lead proves a heavy favorite as sound control material

Heavy metal, often associated with plastic foam and aluminum, is helping to meet OSHA requirements in factory machinery and quieting factory-made products

Lead is best for blocking the sound coming from noisy machinery, says the Lead Industries Association (LIA).

It is being incorporated in many products because it offers excellent sound insulation properties and can be tailored to meet the various specific demands for noise control.

Noise pollution is one of the most serious problems facing industry today. Statistics show that more than 10% of the country's working population suffers severe noise-related hearing impairment and it has even suggested that workers subjected to the highest industrial noise levels are prone to heart disorders, circulatory and equilibrium problems.

As the result of such problems, the Occupational Safety and Health Act (OSHA) now requires that any industry with noise levels of more than 90 dBA must provide a hearing conservation program for its employees. This requirement encompasses approximately 40% of all industrial manufacturers, and it is expected that approximately $1.5 billion will be spent to implement the hearing conservation program to comply with noise regulations. Most of the funds allocated by industry for noise control will be spent for new products and systems that will dampen, muffle or insulate machinery noises.

...of the use in ...ndle a spe... hand. Furth... a medium-... speed of a ... by 67%; ... decrease the ... grinder ... noticed one ... method to ... improvement ... a rubber bar ... sound emis... had without ...

Increasing ... more ... ngs of the ... sound barrier properties of lead to be more sound attenuation efficient-ness of these products. Many of these enclosures are made up of panels consisting of sheet lead and mass-metal polyurethane foam combinations. Some of these combinations contain more than one sheet of lead separated by layers of foam to enhance sound attenuation properties over that of an equal sheet of lead in a single sheet.

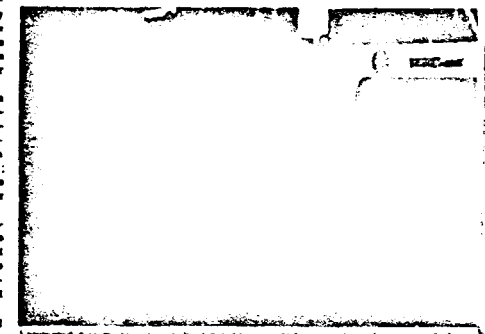
Lead foam systems. Typical of such machinery enclosures is a new modular sound control system to enclose forest products machinery developed by Maier Engineering, Des Plaines, Illinois. The furniture machinery sound control system consists of 1¼-in.-thick lead foam material, an extruded aluminum framing system, and flat aluminum sheets, in gauges ranging from .040-in. to .063-in., for the exterior face of the panel.

The combination lead and aluminum foam material, produced by the Scantlin Co., Brooklyn, N.Y., is a modular panel system consisting of two ¼ psf (.007-in.-thick) sheets of lead mechanically bonded to aluminum foam. This combination is then bonded to the backside of the metal exterior and interior face panels. The aluminum foam will not "bleed out" or delaminate from the sheet lead like most other materials. The lead aluminum foam also tends to be self-damping should vibrations have to drift down in the panel, e.g., for chemical resistant. The material surrounds the cable and leads to steel protected openings through which sound could travel.

The enclosure system, though regulations for fan recirculation and it is designed to meet OSHA standards depending on how carefully it is installed and the original noise levels encountered.

The system is designed to bring 90 dBA machinery noise sound levels to 80 dBA outside the unit. OSHA regulations say a worker can perform tasks for eight hours in a 90 dBA noise environment. The exposure to a sound level of 115 dBA at which a worker can perform for only 15 minutes unless protected from such noise levels. They are so high that conversation is impossible.

According to Maier Engineering, the system can be custom-built to enclose any type of machinery regardless of size and configuration. The enclosure design features openings at either end so that wood, input and output can enter and leave the work station. Glass panels installed in the sides of the enclosure permit an unobstructed view of the work being performed and, in addition, allow visual communication between the



Laboratory tests to evaluate lead foam's sound-deadening power on portable spray grinder noise was cut by 80% compared to unprotected version of machine

Feature article: "Lead Proves A Heavy Favorite As Sound Control Material"

Published in: PRODUCT ENGINEERING

November, 1973

LIA15174

BATTERY POWERED VEHICLES APPROVED FOR HAZARDOUS AREAS

An important segment of the new OSHA Occupational Safety and Health Act is concerned with the use of industrial vehicles in hazardous areas. Basically a hazardous industrial area exists where various ignitable or explosive gases, vapors, dusts or fiber particles are present in the atmosphere in sufficient quantities to cause fires or explosions.

These conditions are commonly found in chemical and petroleum plants, flour and grain mills, underground mines and plants engaged in the production of ammunition, paint and varnish products.

Three classes of hazardous locations are defined by OSHA:

Class I locations: those in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class II locations: those which are hazardous because of the presence of combustible dusts.

Class III locations: those where easily ignitable fibers or flyings are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures.

The first section of the OSHA powered industrial truck specifications states that all new vehicles must meet design specifications established in the American National Standard Institute (ANSI) Powered Industrial Truck publication B56.1-1969, Part II. ANSI is one of several nationally known organizations whose materials handling equipment fire protection recommendations become law when adopted for powered industrial trucks.

The regulations also state that all materials handling equipment to be operated in hazardous locations must be clearly marked with a label or some other identifying mark indicating their approval for use in one or more of the three hazardous locations.

OSHA regulations specify battery-powered explosion-proof vehicles as the only types permitted to operate in all three classes of hazardous industrial areas.

A key factor in the ability of materials handling equipment to qualify for the EX (explosion-proof) Label is the requirement for an explosion-proof battery. Lead acid battery manufacturers have played a leading role in helping the producers of lift trucks and other types of materials handling equipment to qualify their vehicles for the EX Label by working with them to develop specially designed explosion-proof lead acid batteries.

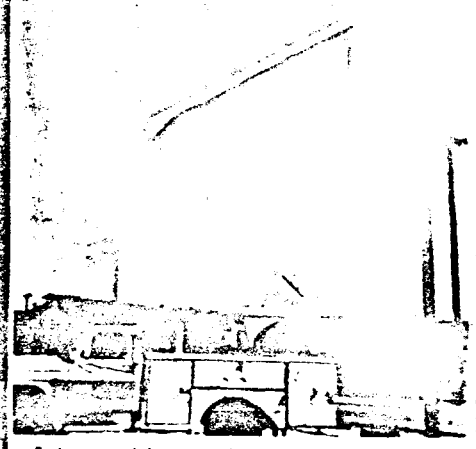
From a fire protection standpoint, the most critical component of EX Label vehicles is the electric power system. The batteries of such vehicles are enclosed in special trays that have 3/16-in. thick hinged steel covers. Ventilation for the trays is provided by a design that precludes the accidental insertion of foreign objects through the vents in such a way that a short could occur across the cell terminals.

The housing for the battery may consists of a 5/16-in. thick multiple area compartment. A fuse block for control and power circuits is built into the housing. A tumbler type lock is fitted to the fuse block to prevent unauthorized personnel from engaging or withdrawing the connector plug.

EX Label vehicles also are provided with explosion-proof enclosures for the lift pump and traction motors and all electrical components. As added safety precautions, electrical conduit from the battery to the drive and pump motors is covered in flexible woven wire.

Rules and regulations listed in the new OSHA requirements also establish 12 specific safety steps to be followed when charging or changing the lead acid batteries of electric-powered vehicles operating in hazardous areas. They include a requirement that battery charging installations be located in specific non-hazardous areas designated for that purpose and a ruling that battery compartments and/or covers shall be kept open to dissipate heat while charging batteries.

ELECTRIC VEHICLE NEWS/NOVEMBER



Replacing street lights was one of the many jobs performed by Arkansas Power & Light Company servicemen in Hot Springs, Ark., when the trailer underwent a 25-week test of the feasibility and operating economy of using power supplied by lead acid batteries to operate the hydraulic lift mechanism of a truck-mounted aerial lift bucket. The test provided proof that batteries provide hydraulic lift mechanism power more efficiently and at far less cost than the traditional power source for such mechanisms, a power take-off unit coupled to the truck engine motor. Batteries are not visible in photo because they are installed in a specially built box located on the floor of the truck chassis just behind the cab. Tel-E-Lect Corp., Minneapolis, Minn., built the prototype bucket truck in cooperation with the utility and has announced production of bucket trucks equipped with the aerial device and as battery power source.

Feature article:"Battery Powered Vehicles Approved For Hazardous Areas"

Published in: ELECTRIC VEHICLE NEWS
August, 1973

Photo Caption on battery operated hydraulic lift mechanism.

Published in: ELECTRIC VEHICLE NEWS
November, 1973

LIA15175

AMERICAN METAL MARKET

OCT 22 1973

Leaded Vinyl Sound Barrier Used in Air Cushion Vehicle

PUEBLO, Colo. — Lead dispersed in vinyl is being used by Grumman Aerospace Corp. engineers here to overcome unusual acoustical problems encountered in designing the company's experimental tracked air-cushion research vehicle, according to a spokesman.

Built for the United States Department of Transportation to test a high-speed ground transportation concept, the vehicle is currently being evaluated along a mile-and-a-half track near here.

For present test purposes, the tracked air cushion is being evaluated by attaching three turbofan engines, mounted in a streamlined pod atop the rear of the vehicle. These provide power for the creation of air on which the vehicle rides and also thrust to propel it up to 138 miles per hour.

The Grumman spokesman noted that during this present phase, noise protection from the turbofan jets is the prime consideration.

Later when the tracked air-cushion vehicle is used, noise will come from many sources, including engine noise and aerodynamic noise, also known as boundary layer noise.

The latter, he said, tends to become more intensely and creates a continual excitation of the fuselage skin. Depending on a craft's speed and shape, it can create extremely high noise inside the craft.

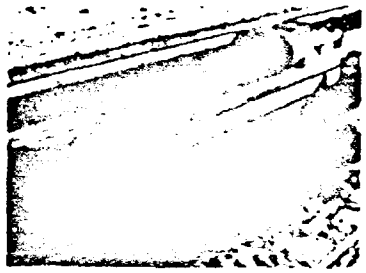
The two noise sources together will result in overall noise levels of 110 decibels (dB) in the unmodified cabin. This, the spokesman said, can be compared to the highly amplified sound of a hard rock band and can be extremely distracting and also detrimental to hearing.

In the present stage of testing, only the vehicle's cabin had to be insulated against sound.

The sound control system required two essential ingredients — a barrier between the craft's engines and the cabin interior to block airborne sound, and methods to dampen airborne structure-borne sound radiation and further engine vibrations, the Grumman man said.

A multi-material system incorporating lead was chosen to control sound between the exterior skin and cabin interior headliner.

The spokesman described the barrier as 1 psf loaded vinyl lead powder dispersed in vinyl.



NEW USE FOR LEAD: To make the experimental tracked air cushion research vehicle quiet, Grumman Aerospace Corp. engineers sandwiched lead powder dispersed in vinyl between two layers of polyurethane foam.

manufactured between two layers of one-half inch thick polyurethane foam and secured in place by the cabin headliner.

The spokesman noted that this technique eliminated the need for fasteners which would have penetrated the loaded vinyl and provided a large number of routes for noise to enter the cabin.

Another advantage of using lead-in vinyl, he said, is that it is virtually free-standing, thereby improving its effectiveness as a sound barrier.

Incorporation of a 1 psf loaded vinyl

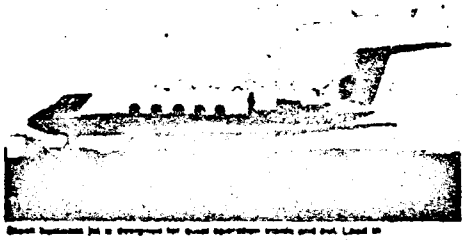
Feature article: "Leaded Vinyl Sound Barrier Used In Air Cushion Vehicle, and notice on same subject.

Feature article published in: AMERICAN METAL MARKET, October 22, 1973

Notice published in: TECHNICAL SURVEY November 10, 1973

NOV 10 1973

"Stewart-Warner's new warning light and directional signal for tractors and other off-the-road equipt, uses a small die-casting as the mounting for the whole unit. Shaped like a lollipop, it is entirely without gaskets and screws. The simplified construction permits easier and quicker lamp-bulb change (pr). ... Grumman Aerospace is solving sound control problems in their tracked air-cushion research vehicle via lead-dispersed in vinyl. The sound barrier technique sandwiches 1-psf leaded vinyl between 2 layers of 1½-in thick polyurethane foam and holds it in place with the cabin headliner. This eliminates fasteners which would penetrate the barrier and provide many routes for noise to enter the cabin. The free-floating nature of the sound barrier enhances its effectiveness (AMM/Metalworking News, 10/25 p 25).



Sheet laminate jet a component for sound absorption inside and out. Lined in combination with plastic foam, and in the plastic block absorbing noise

Heavy sound wall chosen for Grumman business jet despite weight penalty because it proved to be the most efficient noise barrier

Sheet metal and foil. Lined in plastic block absorbing noise

New jet despite weight penalty because it

engine at 35,000 ft has almost the same free-stream dynamic pressure as the TACKY at 300 mph at the level. However, Grumman engineers had a distinct advantage in designing the TACKY cabin since they had already designed the highly effective sound control system for the GIII. Based on the previous experience and knowledge gained in developing the sound control system, it was easily incorporated into the vehicle.

To insulate the cabin, the multi-material noise insulation system was applied in the same manner as the system installed in the Gulfstream II: damping loaded vinyl was applied to about 90 per cent of the skin area, a 4-in. thickness of low density fiberglass was compressed into the 5-in. depth between the frame cage and a 1 psf loaded vinyl sandwiched between two ¼ in. thicknesses of polyurethane foam was installed over the fiberglass before the cabin lining was installed. In addition, a 1 psf loaded vinyl curtain was suspended behind the aft cockpit bulkhead to provide additional insulation from the noise of the rear-mounted turbofans.

The noise laboratory in providing the research vehicle operator and test engineers with a quiet environment for the test program. During the present phase when the vehicle is being tested at speeds of up to 125 mph, noise protection from the turbofan jets is a primary consideration. Later, when the second phase of the tests are underway and the lower induction motor is used to achieve the vehicle's maximum 300 mph speeds, noise will come from two sources—turbofan engine noise and boundary layer noise.

LIA15177

Tips and trends

Facilities & Utilities

Get the lead in, get noise out

Sound-insulated enclosures are one way to control noise from industrial equipment that originally was considered either too large to equip with adequate sound control, or else was already installed without built-in noise control.

According to the Lead Industries Association, an increasing number of machinery enclosure makers are taking advantage of the sound barrier properties of lead to ensure sound attenuation of their products. Many of these enclosures are made up of panels consisting of sheet lead and acoustical polyurethane foam combinations. Some contain more than one sheet of lead separated by layers of foam to enhance sound attenuation properties over that of an equal mass of lead in a single sheet.

Typical of such enclosures is a new modular sound control system developed by Maher Engineering, Des Plaines, Ill., to enclose furniture production machinery. The system consists of 1½-in. thick (3.8 cm) lead/foam material, an extruded aluminum framing system, and flat aluminum sheets in gauges ranging from 0.49 to 0.062 in. (0.12 to 0.16 cm) for the exterior faces of the panel.

The combination lead and acoustical foam material, produced by Soundcoat Co., Brooklyn, N.Y., is a modular panel with two ⅛ psf sheets of lead sandwiched to acoustical foam. This combination is then bonded to the backside of the metal exterior and interior face panels. The acoustical foam won't "dust out" or delaminate from the sheet lead like some materials. It also tends to be self-healing should workmen have to drill holes in the panel.

Elsewhere, a foam-and-lead installation was one of several reasons Ingersoll Rand's Cosmic Products Div., Mayfield, Ky., achieved a 17% loudness reduction in its line of 7000-cfm packaged centrifugal compressors (FACTORY-Feb '73,p. 13). It used a steel shroud laminated to a combination lead/foam sound barrier to get the downtime, marking the first time such equipment has operated with a sound level of 84 dBA. By comparison, original levels were as high as 100 dBA.

Engineering Industries, Inc., Madison, Wis., solved a similar noise problem and realized a $2500 cost saving by installing thin, one-sixteenth inch sheet lead to five in-production plastic scrap grinders.

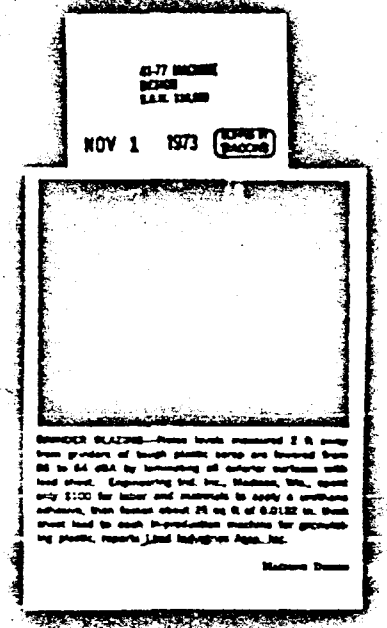
Two techniques were considered, shipping the machines 400 miles to the firm's plant while a noise abatement cavity skin could be installed, or applying sheet lead directly at the plastics plant. The maker chose the latter method, saving more than $2500 in shipping costs and eliminating 10 to 12 weeks of downtime while the machines were being altered.

Several techniques were tested to determine how the sheet lead could be most effectively and economically installed. In the first test, workmen spent 20 hours, laminating sheet lead to the interior face of all hopper walls, underneath portions, and the interior of pedestals, air ducts, and covers of two machines.

In the second test, the outside face of two machines was laminated in 15 hours. The second method was not only faster, but was just as effective as the first. Laminating the sheet lead to the machines' exteriors allowed lead surfaces to be spray-painted to match machine decor. Each machine required about 25 sq ft (2.3 sq m) of 2-psf sheet lead. A special urethane adhesive bonded the sheet lead to the exterior of the machines. Total cost for labor and materials came to $100 per grinder, a savings of $300 over the first technique.

Readings before installation of the lead sheet was 88 dBA at 2 ft from the grinder. Following installation, the count was 64 dBA. ☐

Factory, November, 1973



NOV 1 1973

GRINDER GLAZING—Noise levels measured 2 ft away from grinders of bumper plastic scrap are lowered from 88 to 64 dBA by laminating of exterior surfaces with lead sheet. Engineering Ind. Inc., Madison, Wis., spent only $100 for labor and materials to apply a urethane adhesive, then fasten about 25 sq ft of 0.062 in. thick sheet lead to each in-production machine for grinding plastic, reports Lead Industries Assn. Inc.

Machine Design

Feature article: "Get Lead In, Get Noise Out", and Photo Caption: "Grinder Glazing?

Feature article published in: FACTORY November, 1973

Photo Caption published in MACHINE DESIGN November 1, 1973

LIA15178

21-12 CIRCUITS MANUFACTURING Vol. 21,000

SEP 1973

TECHNOLOGY ASSESSMENT

Soldering Preforms

TIME SAVERS, THEY SIMPLIFY THE TASK OF JOINING METALS

Not too long ago, many solder joining operations used only the time-tested, pedestrian soldering iron and a solder wire or bar. Today, the continuous effort by many industries to partially or completely automate production lines has brought many changes in soldering procedures and techniques, for example increased use of solder preforms, according to a survey by the Lead-Industries Association (LIA), Inc. (NY, NY). Preforms are manufactured solder configurations containing a fixed quantity of metal alloys – with or without a flux core. You can manually place preforms on the solder area or use a machine to dispense them automatically.

Conventional heating methods compatible with your application can join the hipless preform to the assembly. Such methods include hot-air and torch, induction or resistance heating, gas torch, oven or hot plate.

Variations on four basic preform shapes make up all the shapes marketed (Fig 1). These basic shapes include: Wire. You can fashion round, square, oblong and oval shapes from solid wire or flux filled wire. Coiling and bending the wire can shape it into continuous loops and other odd shapes.

Punched parts. Solid wire or flux-filled material can form discs, washers, sleeves and odd shapes. Flux-filled discs require a solid portion to join the top and bottom of the disc.

Spheres. Spherical shapes assume only a solids.

Solder-coated metal forms. These pre-coated metal preshapes contain a specific thickness of solder alloy.

sequential soldering

Solder preforms come in a variety of alloys developed for joining specific metals. Alloy contents range from nearly 100% lead to as low as 30% lead. In most cases, the alloy contains tin, according to the LIA report.

An assembly can sometimes utilize two or more different types of solder alloys to make joints in sequence. Called sequential joining, this method makes use of the fact that different alloys melt at different temperatures. For example, to join parts of a high precision oscillator coil, you must provide for progressively lower melting temperatures at solder contact points within an area of 2 sq-in to avoid harming the previous bond. In the first step, you resistance-solder the sleeve and stud of the coil to the coil cover using discs and rings composed of 95% lead and 5% silver alloy. This solder melts at about 580°F, and therefore the next parts joined, three glass terminals located immediately adjacent to the sleeve and stud, must be joined using a solder with a lower melting point. Ring preforms made from 63% tin and 37% lead, which melt at 345°F do the job. The final operation hermetically seals the oscillator cover. You make this seal with a preform composed of 28.5% bismuth, 28.5% tin and 43% lead because this alloy has a softening point of 230°F. This temperature proves high enough to seal the lid, and yet not high enough to destroy the solder joint for the three glass terminals.

using solder preforms

A typical example of the more-prevalent lead alloy solder preforms used in the electronic data processing industry are tiny chains of washers used as grounding elements for the wires installed in a component terminal block (Fig 2). The terminal block serves and signals that direct data to and from various parts of the computer. An average computer contains as many as 200 to 2000 such terminal blocks.

Made from 63% tin/37% lead flux-filled alloy, typical chain washers have a 0.100" O.D. and a 0.060" I.D. You set the chain washers by hand along every other row of the gold-plated square pins to which the wires join. Because the preforms come in chain form, you can set a row of 20 pins at one time rather than mounting to the time-consuming task of placing solder around the pins one by one. The computer wires join to the pins with the 63/37 alloy along every other row because the terminal is wired in a "twisted pair" arrangement whereby one wire (the one with the lead alloy) serves as the electrical contact, while the other (the one with the tin alloy) serves as the ground connection. Individual block wiring elements in the upper or lower row of terminals are tied to the bar which serves as the terminal ground or

Fig 1 More than 20 different types of lead alloy solder preforms give some idea of the variety of preform shapes available to you.

Fig 2 Chain washers typify the lead alloy solder preforms developed to solve joining problems encountered in the electronic and data processing industries. This chain washer is 63% tin and 37% lead alloy, permits rapid hand-placement of preforms around the base of hundreds of tiny gold-plated square pins in a computer terminal block.

Fig 3 Typical circuit board that

Feature articles and Photo Captions on Soldering Preforms appeared in:

CIRCUITS MANUFACTURING, September, 1973;

INSULATION CIRCUITS, November, 1973;

and DESIGN NEWS, November 5, 1973

Lead Alloy Preforms For Solder Joining Operations

According to the Lead Industries Association, Inc., industrial demand for mass-produced soldered joints has resulted in increased use of lead alloy preforms.

The continuous effort by many industries to either partially or completely automate production lines has brought about many changes in soldering procedures and techniques, according to a recent survey by Lead Industries Association. One soldering innovation yielding increased use is the solder preform. Preforms have been made economical and practical as the result of a number of developments: the availability of high quality solder alloys, faster-acting fluxes, and new techniques for the proper heating of parts.

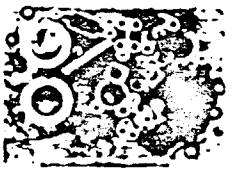
The solder preforms are available in a wide variety of alloys that have been developed for joining specific metals. Alloy contents range from nearly 100% lead to as low as 30% lead. In most cases, the alloy is made with tin. One of the most frequently used tin/lead alloys in the electronics field is a combination of 60% tin and 40% lead. It is a general purpose alloy and almost always is specified for temperature-sensitive electronic components. For example, 60/40 solder is used for printed circuits, one of the major application areas for lead-containing preforms.

Because of their ease of installation, the speed with which they can be assembled, and the highly effective joints they provide, lead alloy preforms also are being used by the thousands to join computer components.

An example of mass-produced lead alloy solder preforms used in the electronic data processing industry are the many tiny chains of washers that are used as grounding elements for the hundreds of wires matched on a computer terminal block. Typical chain washers have a .160" OD and a .040" ID and they are made from 63 (tin)/37 (lead) thin-rolled alloy. The chain washers are set by hand along every other row of tiny pond-coated square pins to which the wires are joined. Because the preforms are in chain form, a row of 31 pins can be "set" at one time. The computer wires are formed to the pins with the 63/37 alloy along every other row because the terminal is wired in a "twisted pair" arrangement whereby one wire (the one with the lead alloy) serves as the electrical contact while the wire in the adjacent row (the one without the lead alloy) serves as the ground and helps to eliminate stray voltages.

There are numerous other applications for lead solder alloy preforms ranging from air filters to wire mesh components, and in all cases their use results in time and money saved in assembly, elimination of solder voids, and an improved soldered joint. Preforms also permit the rapid joining of a wide variety of metals and subminiature assemblies that could not otherwise be efficiently

Solder Preforms



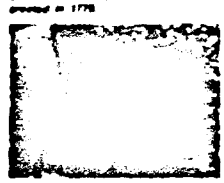
Manufactured solder configurations combine a fixed quantity of metal alloys with or without a flux core. Preforms produce solder fillets for specific joints in an assembly. They can be manually placed on the area to be soldered or they can be dispensed automatically. Once in place, solder preforms are fused by any environmental heating method. Lead Industries Assn., Inc., 292 Madison Ave., New York, NY 10017.

For information, circle 306

CASTING REVIEW AND NEWS

Unearths Fragment Of Revolutionary War Statue Destroyed To Make Bullets

Close-up view of the 20-lb. head and mane of the 4,000-lb. equestrian statue of King George III, which was erected in 1770.



Lewis Miller, the noted cartoonist in Litchfield, and the 20-lb. head fragment of the King George statue he unearthed at Wilton, Conn.

A 20-lb. fragment of one of the most famous pieces of sculpture in American pre-revolutionary history has been unearthed in Wilton, Conn., where it has been buried for nearly 200 years. The fragment is from a 4,000-lb. equestrian statue of King George III, the last king of the American Colonies, that stood for only six years after it was erected atop a high marble pedestal in 1770 at Bowling Green Park on the island of Manhattan.

The story of how the bronze statue got from the island of Manhattan to Wilton, Conn., could serve as the epilogue to the Broadway musical hit, "1776." The play has been made into a popular movie that is now being shown throughout the country.

The statue was made in London – oddly enough in the light of later events, by a man named Joseph Wilton – and shipped to New York where it was unveiled in the summer of 1770. The life-size statue, like other classical Roman statues of the day, was complete with legs, genitals, and a wreath of laurel. The king and his horse appeared to be made from gold, but both were cast from lead and coated with gold leaf.

The statue was never popular among the majority of the Colonists. In fact, it had been standing only one year, when the British erected an iron fence around it (the fence still stands today) and threatened to levy a 500 pound fine on anyone caught defacing the statue.

On July 9, 1776, a courier arrived from Philadelphia bearing a copy of the Declaration of Independence which was read to the officers and soldiers of New York for the first time at the site of what is today the City Hall for the City of New York. That evening, a group of enthusiastic patriots angrily attacked the statue.

Not content with attacking the statue, the patriots placed a rope around Hes Majesty's neck and toppled him and his horse from the marble pedestal. The angry mob then attacked the lead statue with axes, cutting the head from the body, disfiguring the nose, and prying the laurel wreath from the King's head.

Within a matter of days, as the American Revolution got underway, the statue was hacked into pieces of approximately 20 pounds each. With British forces encircling Manhattan and the American Revolution only five days old, the decision was made to use the lead by turning it into bullets to fight the British. The valuable lead was loaded into wagons and carted off to a military depot in Litchfield, Conn., where at least half of it was molded down a bullets for the Continental cording to detailed rec served in Litchfield, ext town made 42,000 bulle scrap lead.

Pellets cast in Litchfield account for only about half of the total tons of lead in the statue and the fate of the missing pieces has been a matter of speculation for many years. It is known that the head, minus the wreath, somehow made its way back to England. In 1832, other parts of the statue began appearing in Wilton, Conn., as a swamp near the center of the town was being drained. Several small pieces of the statue were located at that time, and about 45 years later (1877), a much more spectacular find was made on a farm near the Wilton swamps. Four large pieces weighing about 300 lbs. and including the horse's tail, part of the saddle, and what is believed to be a front of the horse was found. Part of the King's legs and the horse's forelegs were discovered a little later.

Where it isn't known exactly how the pieces of the King George III statue became scattered around Wilton, it is assumed that men driving the wagon to Litchfield stopped off at a tavern in the area and left it unguarded while they rested and ate. Some local Tories (Colonists who were on the side of the British during the Revolution) are believed to have discovered the pieces of the statue and stolen several pieces to keep them from being turned into bullets.

The 20-lb. fragment of the statue that was recently unearthed at Wilton is the only piece to have been discovered in more than 200 years. Louis Miller, a native of Wilton, found the piece in a small swamp that is only about two miles from his home. He located the fragment with an electronic metal detector and as soon as the water had been drained the

Feature article: "Unearth Fragment of Revolutionary War Statue Destroyed to Make Bullets"

Published in: CASTING ENGINEERING

July/August, 1973

LIA15181

ABC AMERICAN BOOFER & BUILDING CONTRACTOR

SEP 1973

ENGLAND INTRODUCES NEW LEAD CLAD COMPOSITE MATERIAL

A NEW COMPOSITE material that combines lead's outstanding corrosion resistance, aesthetic appeal and sound barrier properties with the strength of steel has been successfully introduced in England.

Called roll bonded lead clad steel, the new composite material was developed by the British Non-Ferrous Metals Research Association. It is produced by pressure bonding lead to steel sheets which have been pre-coated 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 metal fabricating techniques and has already been successfully used for commercial and industrial building construction applications in England.

American lead producers have expressed an interest in producing the new lead clad steel for the domestic market because the composite material possesses excellent physical properties for roofing, siding and flashing applications.

Lead clad steel is competitive in cost with other quality metal products used in the construction market, making the use of lead practical for many locations not considered. Some examples include fascia and siding applications which have already been developed in England, and roofing, gravel, dormer spaces and ventilation applications.

Most types of fasteners can be used to mechanically join lead coated steel. Where dissimilar architectural metals are involved to isolate bottoms or other structural members, lead capping panels can be incorporated to provide a continuous lead surface. The use of lead capping panels also helps to camouflage the fastener and retain the pleasing appearance of lead throughout the entire facade.

A compatible, self adhesive paper coating is applied over the lead cladding to protect it during fabricating, shipping and installation. After installation, any exposed edges of lead clad steel can be sealed from corrosion by painting with quick drying primer followed by a coat of finish paint.

The first application in England for lead coated steel was the roof facade of the new National Mutual Life Assurance Co. of Australasia Ltd. This complex shaped office building was designed by Gollins & Partners, Limited in the City of London within the precincts of St. Paul's Cathedral, the new building, like the world famous cathedral, has a lead roof.

The facade of the roof of the six-story building is in the form of an elliptical cone, measuring 140 ft. around the base, 80 ft. high and 170 ft. wide. It is finished externally around the facade of the roof which the building faces.

TOP: Aerial view of the lead roof of the new National Mutual Life Association of Australasia Ltd. Building in London, England. The roof is made up of 250 removable panels, each covered with 5 lb. of lead to absorb noise and, bonded to pre-engineered metal form. Top floors of an adjoining building are visible at upper right. BOTTOM: Close-up view of typical roof panel that has been lifted to show 1" wide lead lap joints that run across full face of 14" plank roof.

Feature article: "England Introduces New Lead Clad Composite Material"

Published in: AMERICAN BOOFER & BUILDING CONTRACTOR

August/September, 1973

Also appeared in TIN INTERNATIONAL, September, 1973

engineering essay

Removing lead from batteries

by J A Peterson
Director of Purchases
Prestolite Battery Div, Eltra Corp

The battery industry is taking an increasing portion of lead consumption, now representing 44% of the total, and if all other uses, including tetraethyl lead, continue their past trend, batteries will represent over 51% of lead consumption by 1980. Despite the existence of batteries on lead (and vice versa), however, we are constantly trying to take lead out of batteries, since 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 utilization of thinner plates or grids, and smaller connectors. The one-piece cover and the through-the-wall inter-cell connection reduced the lead required. This lead, which is basically hard lead, or antimonial lead, was removed without loss of quality.

The move to thinner grids was accomplished through improved antimonial lead alloys and grid design. In 1963, 63% of battery lead was antimonial lead alloys. By 1971, it was 48%, with oxide making up the remaining 14%. By 1980, the ratio of oxide to alloy lead will have increased to 60% oxide and 40% alloyed lead. This will result from further reducing the grid thickness, or in effect, we will be using less lead per battery, and more of the lead will be oxide. Presently, it doesn't seem we can go much beyond this ratio, as no. coverage, although there will be some specialized cases, as there are now, where the ratio of oxide to lead lead is 70-30. Both an increase in purchasing an inefficiency, so I would prefer to stick with the 60-40 ratio as a guide. It must be remembered that this ratio is not accomplished by replacing grid metal with oxide, but by just removing grid metal.

Action needed. We anticipate that oxide use will remain at around 13-1/2 pounds per battery, but the grid lead will be reduced 30% to nine pounds per battery. As the total industry grows, the lead lead requirement for battery grids will increase by 30% between 1971 and 1980, while the oxide requirements will increase by almost 50%. Presently, 70-80% of the oxide used by battery manufacturers is produced in-house, to maintain this percentage, a significant capital investment will be required, and the economics justify the expansion by the battery industry. Both the battery industry and the lead industry must prepare to provide the capacity needed to meet a 50% market increase.

A split of oxide sourcing representing 70-80% in-house capability is healthy and economically feasible for the battery industry. It is wise to be double sourced as them is protection against breakdowns or other problems. At the same time, however, the "make or buy" decision indicates to the battery manufacturer that he should source his own oxide. The 70-80% split in oxide sourcing seems a well thought-out breakdown and one that affords both the oxide producers and the battery manufacturers the best of two extremes. It is important to realize, as we talk of growing oxide use, that while battery weight is going down, the battery market is going up, the net result being an increase in battery lead consumption of 30% by 1980 to 860,000 tons per year.

Calcium alloys. Reduction in grid metal is being aided by the advent of calcium lead alloys, which yield much lower corrosion rates, allowing grid weight reduction without loss of efficiency. Calcium alloys are gaining importance with the introduction of the maintenance-free battery, and, while calcium lead is not new (industrial batteries have used it for many years), it is still true that in the auto battery, where thin grids and high-speed production occur, calcium creates a whole new set of problems. For example, the main reasons that the maintenance-free battery wasn't introduced years ago are that new techniques must be developed to make and handle the grids, and that new separators are required. Up to this point, casting grids has been the most economical approach because of relatively low labor costs (working with lead in pig form as opposed to sheet or rod stock and a low equipment investment). With these handling problems, the battery industry is seriously looking at punching, perforating or expanding grids.

The approaches will differ, but the end result will be to produce a thinner grid without the inherent problems of casting and handling calcium lead grids. These batteries will cause some problems in terms of scrap. Any equipment used to batteries without controversy would affect the secondary lead producers, without controversy, battery scrap would lose its appeal and become a drag on the market. As scrap value goes down, the cost cost to the battery industry will go up, and secondary smelters may have to adjust their pricing to make out, the battery industry will then have to compensate for this. At least this situation will supply the secondary lead industry with some relatively pure lead to smelt. Possibly, we could buy the lead for grid metal from the primary producers and the lead oxide from secondary producers.

Ultra-high purity. Bismuth content also comes up with calcium lead alloys. With some specs as low as 0.001%, alloy corrosion becomes excessive or unfeasibly costly. The bismuth supposedly causes grading which makes the battery less maintenance-free and thus undesirable. Much work remains in this area, and by 1980, we probably won't recognize the calcium lead specifications used today. This problem of ultra-high purity must be met by both the battery industry and the lead industry, so that there will be greater freedom for sourcing and more competitive pricing.

← Cont'd on Page 22

Feature article: "Removing Lead From Batteries", by J.A. Peterson

Published in: AUTOPRODUCTS

November, 1973

LIA15183

Chrome Yellow . . .

Part of the Answer to Traffic Accidents

By Philip E. Robinson
Executive Vice President
Lead Industries Association, Inc.

Philip E. Robinson

LEAD CHROMATE paint will play a [illegible] in the pavement marking programs that are key elements of a massive, nationwide highway safety effort authorized by the Federal Aid Highway Act of 1973.

The two programs were developed to help decrease the staggering toll of traffic accidents that resulted in 55,000 deaths, two million disabling injuries and more than $15 billion in property damages in the United States during each of the last two years. The programs will total nearly $600 million—$175 million for a Pavement Marking Demonstration Program, which will begin in 1974, and $20 million for a Pavement Marking Research and Development Program, which also will begin in 1974.

Two-Thirds Position

The Pavement Marking Demonstration Program authorizes the Secretary of Transportation to approve pavement marking demonstration projects on any two-lane or multi-lane highway on the Federal-aid highway system, in order to bring such highways up to marking standards issued to the States by the Federal Highway Administration. The program is primarily designed to prove the critical need to provide, for the first time, adequate pavement marking on longer, thoroughly marked routes that will reduce the drain of the nation's highway investment dollar.

The Pavement Marking Research and Development Program, [illegible] other, was developed to conduct research and demonstration projects to improve the effectiveness and durability of pavement types of pavement marking and related delineation. The projects also will develop improved equipment and techniques for applying, removing and maintaining pavement markings and delineation during inclement weather and nighttime driving conditions.

Save to Long Run

Traffic control devices such as pavement markings are powerful deterrents of accidents and substantial dollars, manhours and property damage annually. For example, if all highways and streets in the U.S. were properly marked, it is estimated that from 3,000 to 5,000 lives would be saved and from 60,000 to 100,000 injuries would be avoided each year. In addition, it is estimated that the pavement markings would save $2.5 to $4 for each dollar it costs to apply such markings. The difference is measured and dollar figures in the law that the Federal aid, which said such work will be allocated highway construction funds, for pavement marking, for projects on the 23,000 miles of the highway traffic deaths during the 1971 period. It is for the reason that the Pavement Marking Demonstration Program gives priority to marking pavements on such roads.

Local leaders and federal roads and divided routes has provided guidelines on the most economical road to pavement markings on two traffic arteries. They indicate that [illegible] and painted with two [illegible] and, even though they are known to create less markings, such roads have not yet changed to the appropriate system of pavements, in addition to such pavement markings, added that pavement markings also are used to mark the edges of streets and highways, center lines of roadways, other areas to the left of the line for divided roadways or for marking merging areas.

"Highway Yellow"

These types of pavement markings and others, such as stop markings and lanes, must have a highway adhesive mixture, are painted "highway yellow." A special color standard, highway yellow has been specified by the 1971 Manual on Uniform Traffic Control Devices (MUTCD) for all necessary highway traffic control devices, including signs. The paint for highways must usually meet the standard highway yellow color, and is used to paint pavements, a lead chromate, or "chrome yellow" paint. Yellow is the most visible color at the hours are least visible at dawn or in other operations.

In addition to meeting the color standard for highway yellow, chrome yellow paint also possesses many other important qualities that make it the most suitable for all conditions. Because pigmented yellow lead chromate paints are the most durable, they require less maintenance, thereby reducing traffic control dangers. For example, chrome yellow paint has the least susceptibility to abrasion by tires and is resistant to chemical stains and oil from automobiles.

Lack of Funds

The UTCD Manual is intended to serve as the mandatory document for installing traffic control devices such as pavement markings on all streets and highways in the United States. However, there is a major problem in implementing and maintaining with the Manual on a nationwide basis. There are not enough money available.

To understand why the UTCD Manual cannot be fully implemented because of the lack of funds, it is necessary to have a basic understanding of the U.S. highway system, how it came into being, and how it is being maintained.

Of the nearly four million miles of paved streets and highways in the U.S., only 800 thousand miles of interstate, state and county, and municipal systems are considered major roads with high traffic and loads. In order to qualify for such funds, each year must be recommended to the Congress by the President and approved in the UTCD Manual. Because

Friday, November 16, 1973

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Federal Needs

[illegible]

Feature article: "Chrome Yellow...Part of the Answer to Traffic Accidents"
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November 16, 1973

LIA15184

OCT 1973

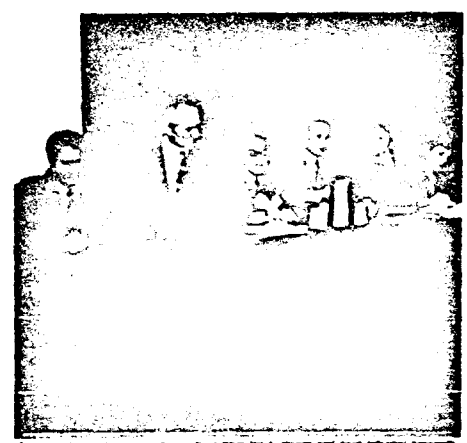
International Brazing and Soldering Conferences Scheduled for Annual Meeting in Houston

Keeping trend with growing interest in the brazing and soldering fields and based on the success of the AWS-WRC Fourth International Brazing Conference and the AWS Second International Soldering Conference held this past April in Chicago, the sponsors of the Conferences have decided to schedule a Third International AWS Soldering Conference and a Fifth International AWS-WRC Brazing Conference. They will be held in conjunction with the 1974 AWS Annual Meeting and Welding Exposition at the Albert Thomas Convention and Exhibit Center in Houston, Texas during May 6-10, 1974.

On this occasion, papers by both USA and foreign authors will be presented on brazing and soldering applications and brazing and soldering research and development. The papers to be presented will be previously unpublished and they will represent a wide range of interests.

During 1972, both conferences were held at Chicago's McCormick Place in conjunction with the AWS 54th Annual Meeting and 1972 Welding Show which featured 134 exhibits and attracted a record number of visitors. The Soldering Conference was co-sponsored by the Lead Industries Association, and AWS and the Welding Research Council were joint sponsors of the Brazing Conference.

These events were started by the AWS Committee on Brazing and Soldering as a result of the need to promote knowledge and information in these fields which were scattered throughout a number of sessions and publications. Also important was the fact that the number of applications for these processes had substantially increased in the past decade and that all signs pointed to even greater usage in the 1970's. During that time, the performance requirements of brazed and soldered joints had, likewise, become more stringent. In brazing, designs are engineered and brazements are fabricated to perform with unexciting reliability in the aerospace, aircraft, nuclear and other equally sophisticated industries. In soldering most of the changes have occurred in the electrical and electronic industries and have been promoted by the trend to miniaturized components, assemblies and equipment.



A group of industry personnel questions three key members and guest industrial personnel during an exhibit/poster session held during the highly successful Joint Brazing and Soldering Conferences (Brazing) held this past April in Chicago. Shown from left to right are Messers. R. Wood, Aluminum Corp.; R. H. Moseley, Kaiser Aluminum; A. M. Sampson, Moseley & Hermann; J. R. Terrell, Alcoa; B. Lyman, Lead Industries Assoc.; and R. L. Peaj, Consultant.

Through annual brazing and soldering conferences, the Brazing and Soldering Committees hopes to contribute the information on these processes in one source, the American Welding Society, and to publish the papers in the Welding Journal, and at the same time, generate more interest and activity within AWS in brazing and soldering.

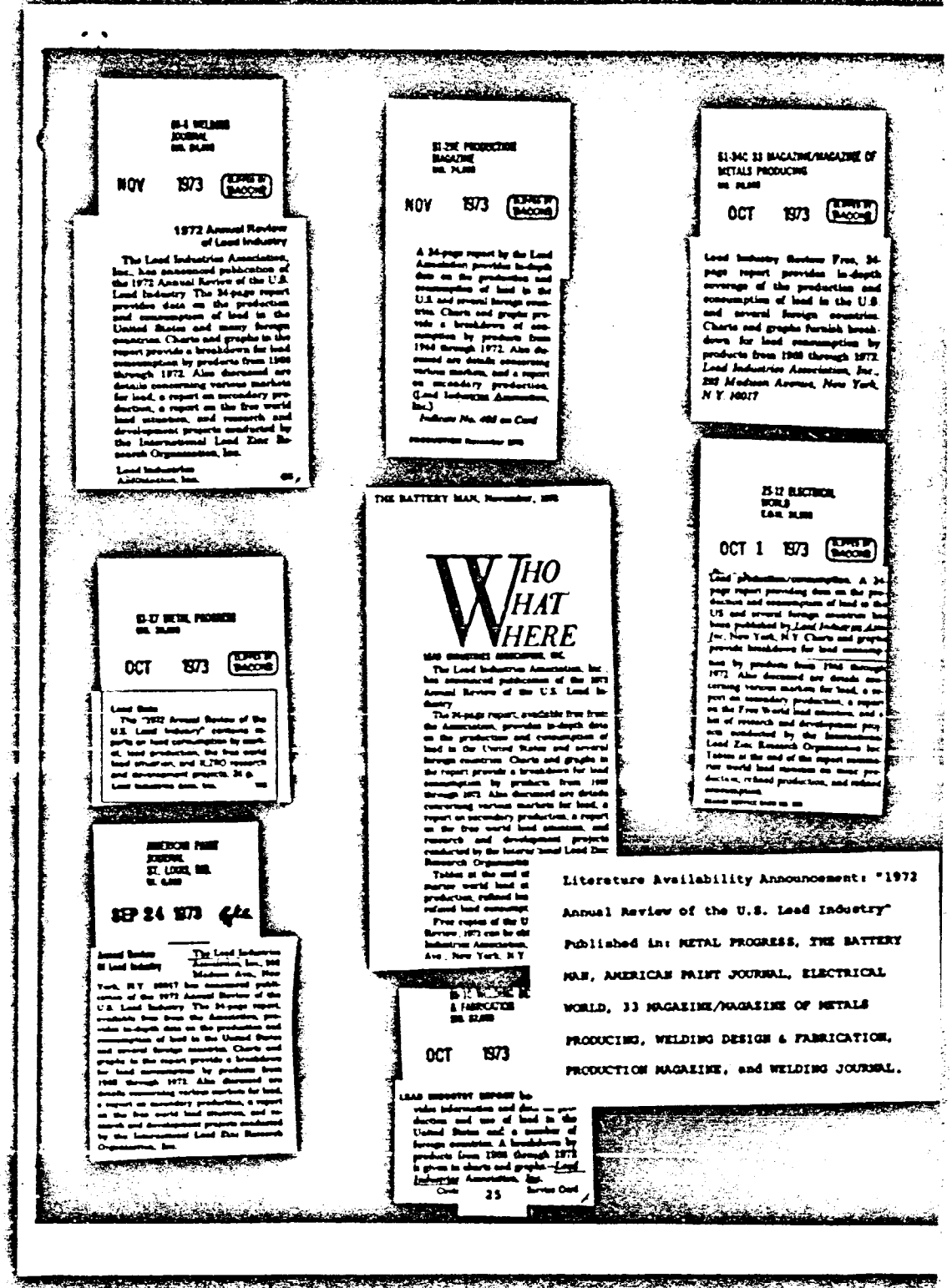
The Fifth International Brazing Conference and the Third International Soldering Conference promise to be even better than the previous ones. The AWS Committee on Brazing and Soldering has taken great care in selecting topics of timely interest for the

Article: "International Brazing and Soldering Conferences Scheduled For Annual Meeting in Houston"

Published in: WELDING JOURNAL

October, 1973

LIA15185



1972 Annual Review of Lead Industry

The Lead Industries Association, Inc., has announced publication of the 1972 Annual Review of the U.S. Lead Industry. The 34-page report provides data on the production and consumption of lead in the United States and many foreign countries. Charts and graphs in the report provide a breakdown for lead consumption by products from 1968 through 1972. Also discussed are details concerning various markets for lead, a report on secondary production, a report on the free world lead situation, and research and development projects conducted by the International Lead Zinc Research Organization, Inc.

Lead Industries Association, Inc.

NOV 1973

NOV 1973

A 34-page report by the Lead Association provides in-depth data on the production and consumption of lead in the U.S. and several foreign countries. Charts and graphs provide a breakdown of consumption by products from 1968 through 1972. Also discussed are details concerning various markets, and a report on secondary production. (Lead Industries Association, Inc.)

Indicator No. 468 on Card

OCT 1973

Lead Industries Review Free, 34-page report provides in-depth coverage of the production and consumption of lead in the U.S. and several foreign countries. Charts and graphs furnish breakdown for lead consumption by products from 1968 through 1972. *Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017*

OCT 1973

Lead Data

The "1972 Annual Review of the U.S. Lead Industry" contains reports on lead consumption by end-use, lead production, the free world lead situation, and ILZRO research and development projects. 34 p. Lead Industries Assn. Inc.

THE BATTERY MAN, November, 1973

WHO WHAT WHERE

LEAD INDUSTRIES ASSOCIATION, INC.

The Lead Industries Association, Inc., has announced publication of the 1972 Annual Review of the U.S. Lead Industry.

The 34-page report, available free from the Association, provides in-depth data on the production and consumption of lead in the United States and several foreign countries. Charts and graphs in the report provide a breakdown for lead consumption by products from 1968 through 1972. Also discussed are details concerning various markets for lead, a report on secondary production, a report on the free world lead situation, and research and development projects conducted by the International Lead Zinc Research Organization.

Tables at the end of the report summarize free world lead production, refined lead consumption, and refined lead consumption.

Free copies of the 1972 Annual Review of the U.S. Lead Industry are available from the Lead Industries Association, Inc., 292 Madison Ave., New York, N.Y.

OCT 1973

Lead Industries Review Free, 34-page report provides in-depth coverage of the production and consumption of lead in the U.S. and several foreign countries. Charts and graphs furnish breakdown for lead consumption by products from 1968 through 1972. *Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017*

OCT 1 1973

Lead production/consumption. A 34-page report providing data on the production and consumption of lead in the U.S. and several foreign countries has been published by *Lead Industries Assn., Inc.*, New York, N.Y. Charts and graphs provide breakdowns for lead consumption by products from 1968 through 1972. Also discussed are details concerning various markets for lead, a report on secondary production, a report on the Free World lead situation, and a list of research and development projects conducted by the International Lead Zinc Research Organization, Inc. Tables at the end of the report summarize free world lead statistics on lead production, refined production, and refined consumption.

OCT 1973

SEP 24 1973

Annual Review of Lead Industry — The Lead Industries Association, Inc., 292 Madison Ave., New York, N.Y. 10017 has announced publication of the 1972 Annual Review of the U.S. Lead Industry. The 34-page report, available free from the Association, provides in-depth data on the production and consumption of lead in the United States and several foreign countries. Charts and graphs in the report provide a breakdown for lead consumption by products from 1968 through 1972. Also discussed are details concerning various markets for lead, a report on secondary production, a report on the free world lead situation, and research and development projects conducted by the International Lead Zinc Research Organization, Inc.

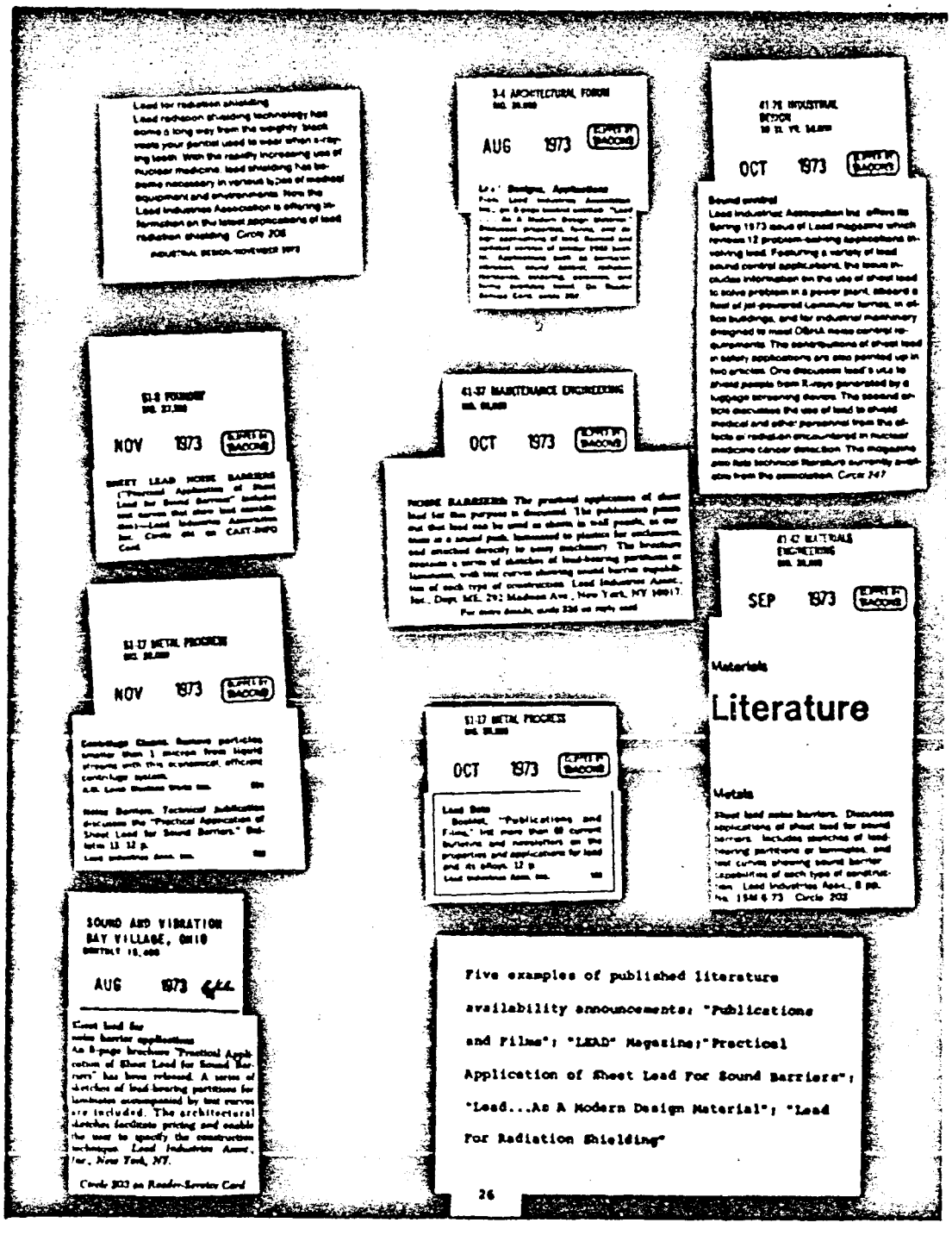
OCT 1973

LEAD INDUSTRY REPORT for value information and data — production and use of lead in the United States and a number of foreign countries. A breakdown by products from 1968 through 1972 is given in charts and graphs. *Lead Industries Association, Inc.*

Circle 25 Service Card

Literature Availability Announcement: "1972 Annual Review of the U.S. Lead Industry" Published in: METAL PROGRESS, THE BATTERY MAN, AMERICAN PAINT JOURNAL, ELECTRICAL WORLD, 33 MAGAZINE/MAGAZINE OF METALS PRODUCING, WELDING DESIGN & FABRICATION, PRODUCTION MAGAZINE, and WELDING JOURNAL.

LIA15186


Lead for radiation shielding
AUG 1973
NOV 1973
OCT 1973
OCT 1973
NOV 1973
SEP 1973
OCT 1973
Materials
Literature
Metals
SOUND AND VIBRATION
BAY VILLAGE, OHIO
AUG 1973
Five examples of published literature availability announcements: "Publications and Films"; "LEAD" Magazine;"Practical Application of Sheet Lead For Sound Barriers"; "Lead...As A Modern Design Material"; "Lead For Radiation Shielding"
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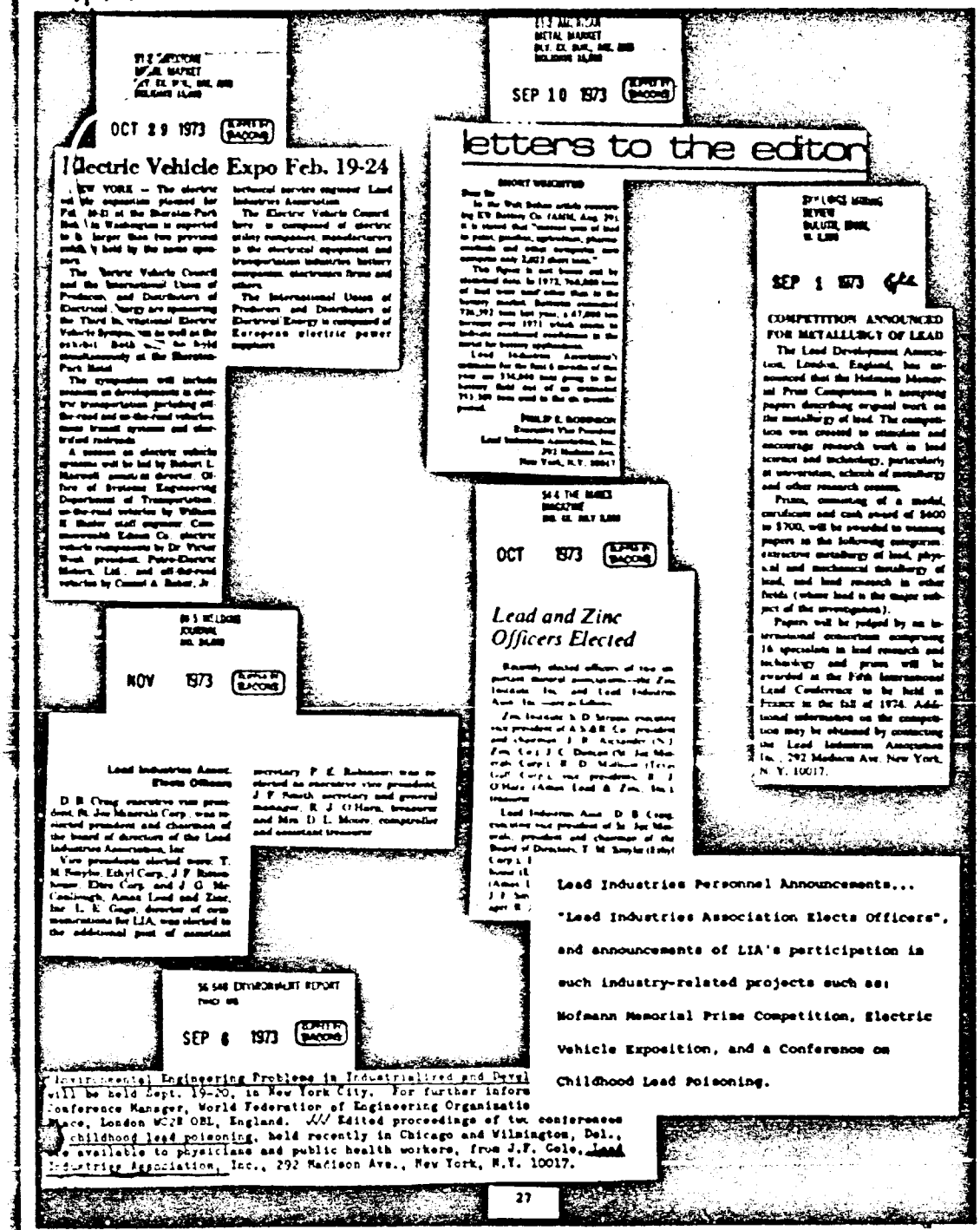

OCT 29 1973

Electric Vehicle Expo Feb. 19-24

NEW YORK — The electric vehicle exposition planned for Feb. 19-24 at the Sheraton-Park Hotel in Washington is expected to be larger than two previous exhibits held by the same sponsors.

The Electric Vehicle Council and the International Union of Producers and Distributors of Electrical Energy are sponsoring the Third International Electric Vehicle Symposium, to be held in conjunction with the exhibit. Both — the exhibit simultaneously at the Sheraton-Park Hotel.

The symposium will include discussions on developments in electric transportation including off-the-road and on-the-road industrial, mass transit systems and electrified railroads.

A session on electric vehicle systems will be led by Robert L. Maxwell, consultant director, Office of Systems Engineering, Department of Transportation, on-the-road vehicles by William H. Huber, staff engineer, Commonwealth Edison Co., electric vehicle components by Dr. Victor Wouk, president, Power-Electric Motors, Ltd., and off-the-road vehicles by Conrad A. Buhler, Jr., technical services engineer, Lead Industries Association.

The Electric Vehicle Council here is composed of electric utility companies, manufacturers in the electrical equipment and transportation industries, battery companies, electronics firms and others.

The International Union of Producers and Distributors of Electrical Energy is composed of European electric power suppliers.

SEP 10 1973

letters to the editor

SEP 1 1973

COMPETITION ANNOUNCED FOR METALLURGY OF LEAD

The Lead Development Association, London, England, has announced that the Hofmann Memorial Prize Competition is accepting papers describing original work on the metallurgy of lead. The competition was created to stimulate and encourage research work in lead science and technology, particularly at universities, schools of metallurgy and other research centers.

Prizes, consisting of a medal, certificate and cash award of $600 to $700, will be awarded to winning papers in the following categories: extractive metallurgy of lead, physical and mechanical metallurgy of lead, and lead research in other fields (where lead is the major subject of the investigation).

Papers will be judged by an international committee comprising 16 specialists in lead research and technology and prizes will be awarded at the Fifth International Lead Conference to be held in France in the fall of 1974. Additional information on the competition may be obtained by contacting the Lead Industries Association Inc., 292 Madison Ave. New York, N. Y. 10017.

OCT 1973

Lead and Zinc Officers Elected

NOV 1973

Lead Industries Assoc. Elects Officers

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

Vice presidents elected were: T. M. Sample, Ethyl Corp.; J. F. Ramsey, Ekco Corp. and J. G. McCullough, Amax Lead and Zinc, Inc. L. E. Gage, director of environmental for LIA, was elected to the additional post of assistant secretary. P. E. Robinson was re-elected as executive vice president, J. F. Ranch, secretary and general manager, R. J. O'Hara, treasurer and Mrs. D. L. Moore, comptroller and assistant treasurer.

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Lead Industries Personnel Announcements... "Lead Industries Association Elects Officers", and announcements of LIA's participation in such industry-related projects such as: Hofmann Memorial Prize Competition, Electric Vehicle Exposition, and a Conference on Childhood Lead Poisoning.

Environmental Engineering Problems in Industrialized and Developing Countries will be held Sept. 19-20, in New York City. For further information, write Conference Manager, World Federation of Engineering Organizations, 39 Portland Place, London W1N 4BR, England. /// Edited proceedings of two conferences on childhood lead poisoning, held recently in Chicago and Wilmington, Del., are available to physicians and public health workers, from J.F. Cole, Lead Industries Association, Inc., 292 Madison Ave., New York, N.Y. 10017.

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