



Lead Industries Association, Inc.

282 Madison Avenue • New York, N.Y. 10017 • Telephone: (212) 878-8030

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 of 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
Secretary & General ManagerJFS:lm
Enclosures

4-116 TRANSPORT
TOPICS
WOLY. 24,000

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CLIPPING BY
BACONS

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 electric vehicles 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 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 electric vehicles 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.

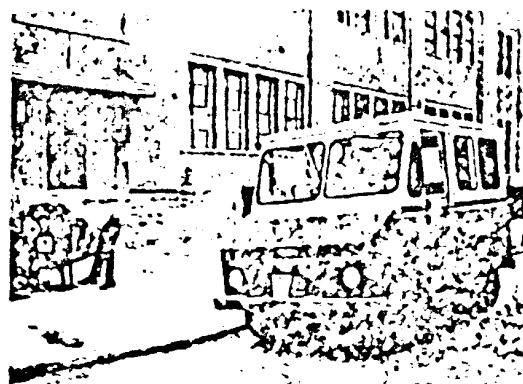
Very Comfortable

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 costs 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 Battlronk Truck Corp., Boyertown, 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 Battlronk is supplying at Allentown is powered by a 46-volt



Allentown postman on run with test vehicle

lead acid battery with a top speed of 47 mph.

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 electric vehicles 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 2½ 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

ENERGY REPORT

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

The more than 100,000 US Postal Service mail-delivery trucks powered by internal-combustion engines are eventually to be replaced by fleets of electric, at a rate of 3,000 vehicles per year. That's what would happen if tests now being conducted in California, Pennsylvania, and Massachusetts prove that lead-acid battery-powered vehicles can deliver the mail more quickly, at lower cost, and with the less energy consumption than internal-combustion vehicles.

One Postal Service official estimates that the initial vehicle replacement program would begin with about 3,000 vehicles, including per year and then, as government facilities expand and providing the electric vehicles program proving themselves the replacement

may could increase to about 3,000 per year.

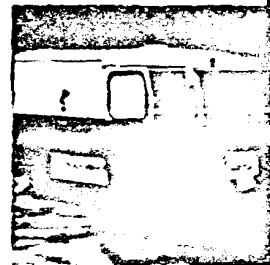
As an indication of the Postal Service's intense interest in evaluating the electric-vehicle-delivery program, it is funding tests of such vehicles in California and San Jose, in northern California (ENR, Dec. 15, 1972, p. 79), in Santa Ana, near Los Angeles, in southern California, in Allentown and Bethlehem, Pennsylvania, and in Lowell, Massachusetts.

The tests are already under way at Capertown, Santa Ana, and Allentown, and they are slated to begin shortly at Bethlehem and Lowell. The five-city program is designed to test various types of vehicles under various conditions, and to determine the ability of such facilities to produce electric-powered vehicles that will meet the Postal Service's needs. It is expected that, in tests,

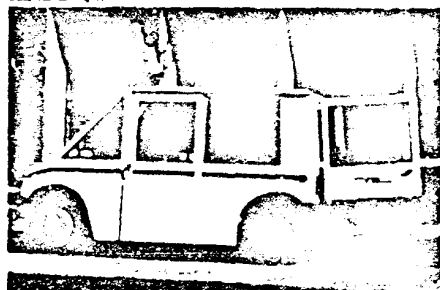
a standard Postal Service electric mail truck will be developed from data gained in these tests.

Allentown test

As part of the tests in Allentown, mail-carrier Frank Weatherhold is piloting a new, all-steel, lead-acid-



vehicles under test by Postal Service include Burlington Truck Company of Allentown and Bethlehem, Pa. (ENR 10/12/72), the Ohio Electric Delivery Vehicle Company (formerly Wheelabrator) of Akron, Ohio (ENR 10/12/72), the Electric Vehicle Co. of Portland, Ore. (ENR 10/12/72), the Electric Vehicle Co. of San Jose, Calif. (ENR 10/12/72), and the Electric Vehicle Co. of Lowell, Mass. (ENR 10/12/72).



Feature article: "Electrics Get Key
Post Office Tests"

Published in: ELECTRICAL WORLD

November 1, 1973

ENR Staff Writer

ENR Staff Writer

Table 1: Calculated vehicle averages, Cupertino, Calif.

	Run 1, 1971, to April 14, 1972	Run 17, 1971, to March 26, 1972	Run 21	Run 22
Cost/mile	2.5¢	2.5¢	2.5¢	2.5¢
Energy use	1.2 kwh/mile (28 m.p.g. equivalent)	0.8 kwh/mile (41.7 m.p.g. equivalent)	0.8 kwh/mile (41.7 m.p.g. equivalent)	0.8 kwh/mile (41.7 m.p.g. equivalent)
Miles/day	11.1	12.4	14.4	14.4
Cost/day	27.7¢	30.4¢	36.0¢	36.0¢
Energy cost	1.3¢/m.p.g.	25.7¢/m.p.g.	25.7¢/m.p.g.	25.7¢/m.p.g.

very-personal truck to deliver the mail in the city's 14th Ward. Unlike the internal-combustion-engine (ICE) vehicle it replaces, the electric truck is very weatherproof. "Very comfortable to handle and drive," he adds, "the vehicle is smooth-operating, and the absence of a hot engine results in a much quieter ride."

Albion's Postal Service supervisor, Richard Timm, says the significant factor, in addition to its being pollution-free, is the fact that the battery-powered carrier does not require about 15 hours to be recharged to power one electric run for a 10-to-12 mile route. A normal service route in Albion averages about 30 miles a day, which is three times the normal average and well within the capabilities of the electric vehicle.

The electric vehicle being tested at Albion is manufactured by Battelle Truck Corp., Berea, Ohio. The nation's leading producer of electric vehicles (Battelle also is producing 100 on-the-road electric vehicles as part of a multi-million-dollar nationwide testing program funded by 15 electric utilities under the sponsorship of the Electric Vehicle Council).

The Legal Industries Association reports that the vehicle Battelle is supplying for the Albion test is powered by a 36-volt lead-acid battery, and has a top speed of 47 mph. Plans call for using the vehicle on a variety of routes in Albion. Carriers operating the vehicle will be asked to rate its performance at the end of the initial test period.

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

Cupertino test

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 ordinary mail delivery. Thirty electric vehicles powered by lead-acid batteries are slated to replace the main-

stream ICE-powered vehicles that comprise Cupertino's present mail-delivery fleet.

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

Cupertino Postmaster Alvin R. Carter says the trucks are easy-to-use, and cost only about one-third as much as the conventional type to operate. The electric run operates for at least two days without recharging the batteries, he says. When a recharger is necessary, the batteries are simply connected into an industrial-type charger. The trucks are powered by two 36-volt lead-acid batteries, and have a top speed of 48 mph on a 7% upgrade. However, they will travel at a maximum of 17 mph to conform with local speed laws.

The almost-silent vehicles produce only a slight hum as they operate, requiring quiet early-morning deliveries. And since they drive power only when in motion, pollution from an idling engine is eliminated, and only the power needed to operate the vehicle is used, thus saving overall power consumption.

The test vehicle has two built-in operators at Cupertino for a test over two years and a lot have utilized on the main routes in the regular Post Office vehicles. The length of these routes ranges from 8 to 15 miles with 100 to 300 stops.

During the test, daily mileage, power consumption, the number of stops, and general maintenance records have been recorded (see Table 1). 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 four mail-delivery runs powered by batteries could be operated at the cost of operating one ICE vehicle.

Reaction to the vehicles by Cupertino postal carriers who operate them has

been generally favorable. One carrier commented that she feels better at the end of the day because the electric vehicles vibrate less and more.

One P. Carter, 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 ground other "non-haul" areas, such as Phoenix, Miami, Memphis and Los Angeles. There other are said, he says, because they are not too bulky and, in addition, their warm climate is suitable for year-round operation of electric vehicles.

Other tests

The vehicle being tested in Santa Ana is designed and manufactured in the Southern (Calif.) Special Vehicle Plant of Ott Electric Co. The vehicle has been tested by Dynamat Systems Laboratories, an independent testing facility in Phoenix, Ariz., which says a month of spontaneous test runs by the Postal Service under its electric-vehicle test program.

The run, called the Ott Electric Delivery Vehicle, was tested about 40 miles on a single charge, and has a maximum speed of 43 mph. Between 6-8 lead-acid batteries power it.

Since the middle of June, the Ott vehicle has been driven on regular mail routes in the Santa Ana area. Homer O'Connor, postmaster of Santa Ana and national carrier manager of the Orange County Postal Dept., says the vehicle is the forerunner of the type of vehicle that will eventually be used on all routes in Orange County. Of the 1,500 routes in the county, 1,000 require vehicles to distribute mail.

The test at Lowell began in late September. An electric delivery was provided by the Transportation Systems Laboratory, a division of Electrochemical Inc., Bedford, Mass., is being used.

The vehicle, 1.8 shorter than a Volkswagen sedan, has 75 cu ft of cargo space for a 7-ton payload, and is somewhat bigger than the present Postal Service jeep. The Electrochemical vehicle has a top speed of 47 mph and a range of 35 miles before its pack of 14 6-volt 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 main brushes.

Costing \$4,800 each, the electric vans are about twice as expensive as the conventional jeeps, but are expected to last 15 years against the 10-year life expectancy of a jeep.

At present average electric rates, the electric van is estimated to operate at a cost of just 1¢ a mile, vs about 2½¢ for an ICE-powered vehicle. □

DAILY NEWSPAPER - AIR DISPATCH

AMERICAN METAL MARKET

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batteries section

Mail Delivery Vehicles
Powered by Batteries
On Replacement Horizon

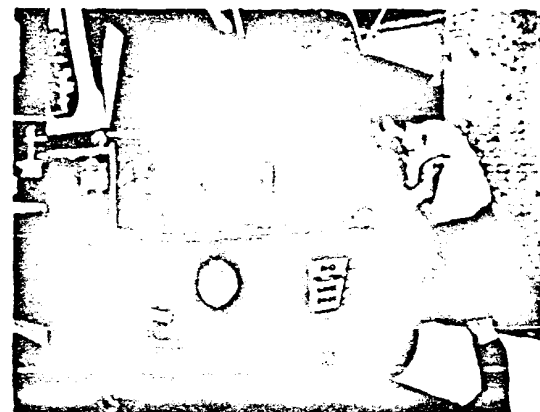
NEW YORK — The more than 100,000 internal-combustion-engine-powered United States Postal Service mail delivery trucks may eventually be replaced by fleets of electric vehicles at a rate of 1,000 vehicles per year. That's what could happen if tests now being conducted in the Eastern United States and in California prove that lead acid battery-powered vehicles can deliver the mails more quickly, efficiently and with far less energy consumption than internal combustion-powered vehicles.

One U.S. Postal Service official announced 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 1,500 electric per year.

As an indication of the Postal Service's serious interest in evaluating the electric postal delivery program, it is sending tests of such vehicles to Capertown, 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 Capertown, Santa Ana, Lowell, and Allentown, and they are slated to begin shortly at Bethlehem. As part of the tests, Allentown mail carrier Frank Waterhouse is piloting a new, all-electric lead acid battery-powered truck to deliver the mail in the city's 10th Ward. The electric truck is, according to Waterhouse, "very comfortable



MAIL CARRIER Frank Waterhouse checks the meters using an electric postal truck currently under test in Allentown, Pa. The electric mail carrier is manufactured by Battelle Truck Corp., Severnstown, Pa., and is powered by a 90-volt lead acid battery.

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

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

Published in: Special Batteries Supplement,

AMERICAN METAL MARKET

November 21, 1973

to handle and drive." He added that the vehicle operates smoothly and the absence of a clutch is a much-improved feature.

U.S. Postal Service Richard Truesdell, mail division director of the battery-powered test fleet, says the trucks are used to operate downtown 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 Capertown, plans are being made for full-scale electrification of the town's mail delivery service as the result of a

program funded by 25 electric utilities under the sponsorship of the Electric Vehicle Council (EVC).

Lead Industries Association (LIA) reported that the vehicle's batteries supplied for the Allentown test is powered by a 90-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.

Capertown Postmaster Arthur R. Carter claimed that the trucks were being free and cost about one-third as much as the conventional type to operate. The electric ones operate for at least two days without recharging the batteries. When a recharge is necessary, the batteries are simply reconnected into an industrial-type charger. The trucks have a top speed of 48 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 Capertown speed laws.

The electric postal vehicles

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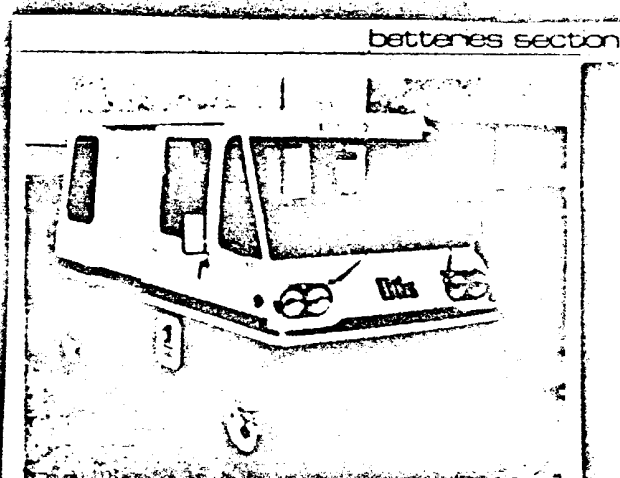
product may a mile more as they accelerate, insuring quiet deliveries. And since they draw power only when in motion, the cost and pollution of an idling engine is eliminated.

The test vehicle has been in operation at Capetown 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 8 to 20 miles, with 50 to 200 stops.

During the tests in Capetown, daily mileage, power consumption, the number of stops and general maintenance readings were recorded. To give this 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 indicated that lead acid delivery vans powered by lead acid batteries could be operated for the rest of operating and internal combustion vehicles.

Favorable Reaction
Reaction to the vehicles by Capetown postal carriers was

(Continued on page 17)



A LEAD ACID battery-powered vehicle produced by Otto Engineering Co.'s Special Vehicle plant, Stockton, Calif., is being used to test the feasibility of electric mail service vans at Santa Ana, Calif.

Electric Vehicles To Speed Mail

(Continued from page 16)

operate them was generally favorable. One carrier commented that the last battery at the end of the day increased the electric business volume of mail.

Don P. Crane, director, Office of Fleet Management at postal head quarters in Washington, D.C., feels that if the 30 vehicles are successful there may be introduced a number of other San Joaquin routes such as Phoenix, Miami, Memphis and Los Angeles. These cities are ideal because they are not too hotly and, in addition, their warm climate is suitable for year-round electric vehicle operation.

According to LIA, in addition to the vehicle Batteries Truck Corp. is supplying for the Alameda and Sacramento tests. Transportation Systems Laboratory is supplying one for the Lowell tests. In California, a combination U.S. Street vehicle will be used for the 20 prototypes for the Capetown "Electric" project. British 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 Vehicle, Inc., San Francisco.

The vehicle being tested at Santa Ana was designed and manufactured in the Stockton, Calif., special vehicle plant of the Otto Engineering Co. The vehicle was pre-tested by

Dynacore Science Laboratories, an independent testing facility located in Phoenix, which met 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 41 mph. Service level load and performance prove the vehicle.

Since the middle of June, the Otis vehicle has been driven on regular mail routes at the Santa Ana area. Marvin Goodman, postmaster of Santa Ana and regional center manager of the Orange County Postal Department and he was the vehicle in the service of the type of vehicle that will eventually

be used on all routes in Orange County. Of the 1,300 routes in the county, 1,200 require vehicles to distribute mail.

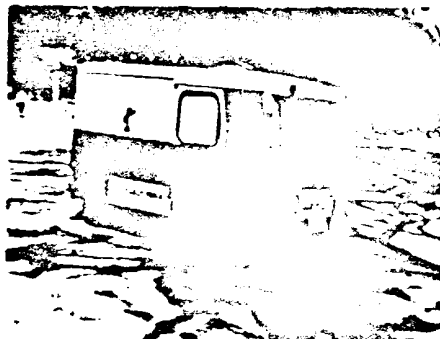
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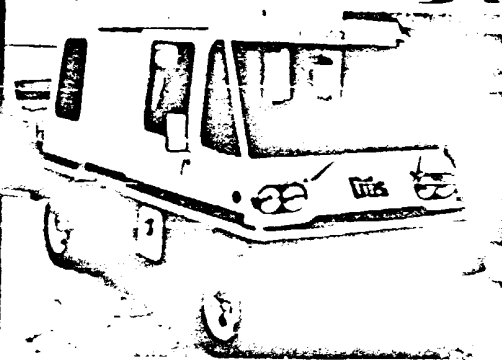
Postal Service Plugging Into EV Mail Delivery

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HARBILTEY



OTIS EV



proving themselves—the replacement rate could increase to about 5,000 electric 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.

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The test vehicle has now been in operation at Cupertino for a little over a year and it has been utilized on the same routes as the regular Post Office vehicles. The length of these routes ranges from 5 to 15 miles with 100 to 300 stops.

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ELECTROMOTION VAN

ELECTRIC VEHICLE NEWS/NOVEMBER 1973

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trical to replace the standard internal combustion vehicles that comprise Cupertino's present mail delivery fleet.

Cupertino Postmaster Alvin R. Carter claims that the trucks are cheap, free and cost only about one-tenth as much as the conventional type to operate. The electric cars 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.

Internal combustion engine—and comparative data were recorded. The overall results of the battery versus internal combustion-powered vehicle 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 felt better at the end of the day because the electric eliminates 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, this may lead to their introduction in several other "sun belt" cities.

Product Engineering

Design engineering feature

Lead proves a heavy favorite as sound control material

Heavy metal, often combined with plastic foam and elastomers, is helping to meet OSHA requirements in factory machinery and existing 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 some 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 6% of all industrial manufacturers, and it is expected that approximately \$1.8 billion will be spent to implement the hearing conservation program to comply with new regulations. Most of the funds allocated by industry for noise control will be spent for new products and systems that will design, modify or replace machinery noise.

Lead has better properties of lead to insure sound attenuation effectiveness of these products. Many of these enclosures are made up of panels consisting of sheet lead and compressed polyurethane foam enclosures. 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. Types of such machinery enclosures is a new modular sound control system in machine tool production machinery developed by Maher Engineering, Inc., Phoenix, Arizona. The machinery machinery noise control system consists of 14-in. thick lead foam material, an extruded aluminum framing system, and the aluminum doors, in gasketing design from Detroit to Dallas, for the exterior face of the panel.

The combination lead and compressed foam material, produced by the Soundproof Co., Brooklyn, N.Y., is a modular panel system consisting of two 14-in. (100% in thick) sheets of lead sandwiched in compressed foam. This combination is then bonded to the backside of the metal exterior and interior face panels. The compressed foam will not "break out" or delaminate from the sheet

lead like some other materials. The lead-compressed foam also tends to be self-healing should workmen have to drill holes in the panel, e.g., for electrical conduit. The material provides the cable and leads to seal potential openings through which sound could travel.

The machinery system simply regulates for the workmen and it is designed to meet noise standards depending on how carefully it is installed and the original noise levels encountered.

The system is designed to bring 94 dBA machinery noise sound levels to 90 dBA outside the unit. Some regulations say a worker can perform tasks for eight hours in a 90 dBA noise environment. This compares 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 preservation is impossible.

According to Maher 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 work input and output can enter and leave the work station. Open panels installed in the side of the enclosure permit an unobstructed view of the work being performed and, in addition, allow visual communication between the

Feature article: "Lead Proves A Heavy

Favorite As Sound Control Material"

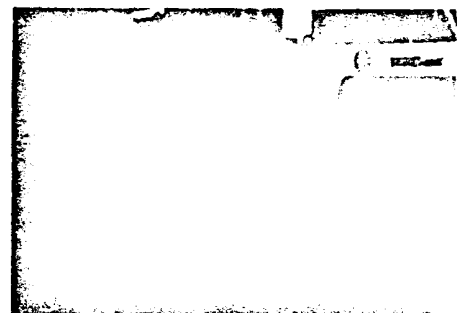
Published in: PRODUCT ENGINEERING

November, 1973

It is one of the best a special feature of a multi-layered sound of a v. by 670; decrease the "gradient"

method to equipment of other two sound controlled without

Increasing noise control of the



Unobstructed directly in general lead encloses universal noise or plastic being grinder noise was cut by 65% compared to unprotected version of machine

Product Engineering, November, 1973

BATTERY POWERED VEHICLES APPROVED FOR HAZARDOUS AREAS

An important aspect 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 create 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 ammonium, paint and various 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 are likely to be in suspension in quantities sufficient to produce ignitable mixtures.

The first version 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 B56.1-1968. 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 type 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.

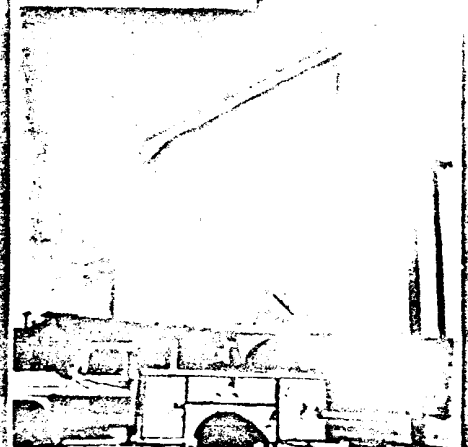
From a fire protection standpoint, the most critical component of EX Label vehicles is the electric power system. The batteries of such vehicles are enclosed in special trays that have 3/16-in. thick forged steel covers. Ventilation for the trays is provided by a design that precludes the accidental 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 tray consists of a 5/16-in. thick multipiece steel compartment. A fuse block for control and power circuits is built into the housing. A tamperproof 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 sections for the lift pump and traction motors and all electrical components. As added safety precautions, electrical conduct from the battery to the drive and pump motors is covered in flexible woven wire.

Rules and regulations based in the new OSHA requirements also establish 12 specific safety steps to be followed when charging or recharging 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 workers in Hot Springs, A.R., when the utility undertook a 25-week run of the frontiers 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 unit provided power pump that batteries provide hydraulic lift mechanism power more efficient, and at far less cost than the traditional power source for such mechanisms, a power take-off unit attached to the truck engine motor. Batteries are not mobile in place because they are installed in a specially built box located on the floor of the truck chassis just behind the cab. Tel-E-Lift Corp., Minneapolis, Minn., built the power-operated bucket truck in cooperation with the utility and has announced production of bucket trucks equipped with the built-in, developed lead acid battery power source.

Feature articles: "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

ELECTRIC VEHICLE NEWS/AUGUST 1973

51.7 AMERICAN
METAL MARKET
N.Y. EX. 194, 195, 196
194, 195, 196

OCT 22 1973

ELECTRIC
PACKING

Leaded Vinyl Sound Barrier Used in Air Cushion Vehicle

PUEBLO, Col. — Lead dispersed in vinyl is being used by Grumman Aerospace Corp. engineers here to solve some sound control problems encountered in designing the company's experimental tracked air-cushion vehicle, according to a spokesman.

Both 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 turbojet engines, mounted in a streamlined pod along the rear of the vehicle. These provide power for the reason of air on which the vehicle rides and also the thrust to propel it up to 125 miles per hour.

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

Later when the latter turbojet engine is used, noise will come from two sources, turbojet engine noise and environmental noise, also known as boundary layer noise.

The latter, he said, tends to be stream with velocity and creates a resonant vibration of the fuselage skin. Depending on a wall's speed and shape, it can cause extremely high noise levels inside the cabin.

The two noise sources together will result in overall noise levels of 120 decibels inside the enclosed cabin. Thus, the spokesman said, can be compared to the highly amplified sound of a hard rock band and can be extremely discomforting and also detrimental to hearing.

In the current stage of testing, every time the cabin had to be reinforced against noise.

The sound control system required two essential ingredients: a barrier between the craft's engines and the cabin interior to block exterior sound, and methods to dampen interior structure-borne sound radiation and turbine engine vibration. The Grumman team said.

A multi-material system incorporating lead was chosen to control

sound between the engine side and cabin interior boundaries.

The spokesman described the barrier as 1-pd leaded vinyl lined 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 in vinyl between two layers of polyurethane foam.

sandwiched between two layers of stacked, each thick polyurethane foam and covered in place by the same barrier.

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

Another advantage of using lead vinyl, he said, is that it is resistant to fire-damage, thereby improving its effectiveness as a sound barrier. Transmission of a 1-pd leaded vinyl

barrier behind the all cockpit reduced the noise of the turbojet and to dampen external noise, and in particular the noise from the environmental turbulence.

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

51.7 AMERICAN
METAL MARKET
N.Y. EX. 194, 195, 196
194, 195, 196

NOV 10 1973

ELECTRIC
PACKING

"Stewart-Warner's new **WARNER** light and directional signal for tractor, and other off-the-road equip, 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-pd lead vinyl between 2 layers of 1/2-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 23).

Design engineering features

bus engine caused an overall noise level of 119 decibels in the occupied cabin. This uncomfortable sound level, which was detrimental to hearing, compares to the noise of a jet fighter at 1000 feet.

Despite this high interior noise level, Grumman specifications called for a quiet interior that was "living room quiet." The company's engineers therefore were faced with the task of developing a sound control system to overcome noise problems present in all jet aircraft.

Grumman's Q-2 sound control system incorporates three essential elements: 1) a barrier between the engine and the cabin interior to block the path of sound waves; 2) methods to damp interior structure borne sound radiation and isolate engine vibration; 3) a method to absorb sound inside the cabin and prevent its re-radiation.

The sound barrier between the engine area and the cabin interior had been a major element in the sound control system. Grumman engineers installed a multi-material system incorporating lead. The sound barrier, located vertically (lead powder dispersed in vinyl), is sandwiched between two layers of compressed expanded foam and is secured in place by the cabin bulkhead. This construction technique eliminates the need for fasteners which would have penetrated the leaded vinyl and provided a large number of points for noise to enter the cabin. Another major advantage of using leaded vinyl in this form is that it is virtually fire-resistant, thereby improving its effectiveness.

The weight of the leaded vinyl was increased for forward sections of the aircraft because these areas are subjected to higher noise levels of boundary layer noise at maximum cruise speeds and, in addition, the plane section subjected to more turbulence in some positions. Three weights of leaded vinyl were used—1.3 pcf for the cockpit, 9.77 pcf for the forward portion of the cabin, and 6.22 pcf for the mid and rear sections of the cabin.

Another modern vehicle, also from Grumman, got the lead treatment too. It's a tracked air cushion train now being tested as part of the U.S. Department of Transportation's plan to develop high speed railroad vehicles that will provide passenger and cargo service between urban areas. Though different in design and function, the YACV faced the same problems as that of the Cutoffman-II (a-4) Business Jet-turbine engine noise and aerodynamic related engine noise (the a-4 at 800



Sound barrier in a composite for best operation tracks and out. Lead in construction with plastic back, and in two plastic blocks supporting noise.



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

mph at 33,000 ft. has almost the same free-stream dynamic pressure as the YACV at 300 mph at its level. However, Grumman engineers had a distinct advantage in designing the YACV since they had already designed the highly effective sound control system for the a-4. Based on this 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 Cutoffman-II. Damping foam was applied to about 90 per cent of the skin area, a 4-in. thickness of low density fiberglass was compressed into the 3-in. depth between the frame rails and a 1 pcf leaded vinyl sandwiched between two 1/4 in. thicknesses of poly-

urethane foam was installed over the fiberglass before the cabin lining was installed. In addition, a 1 pcf leaded vinyl curtain was suspended behind the aft cockpit bulkhead to provide additional insulation from the noise of the rear-mounted turbofan.

The noise insulation is 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 for speeds of up to 125 mph, noise protection from the turbofan jet 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.

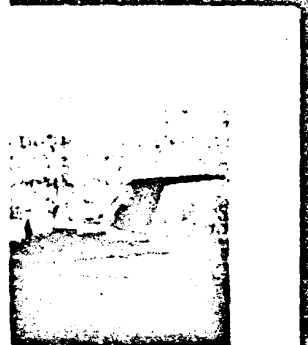
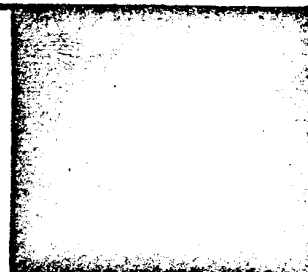
Product Engineering, November, 1970

term of the cabin.

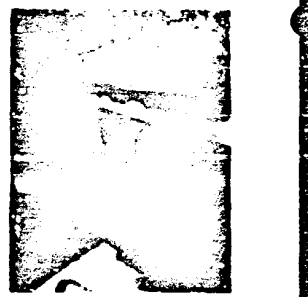
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When inside and out. Lead in plastic block supporting noise.



Lead jet despite weight penalty because

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Get the lead in, get noise out

Lead-included endpapers are now being used to reduce the noise level in a room. The endpapers are made of a material that is designed to absorb sound waves and prevent them from reflecting off the walls and ceiling. This helps to create a more comfortable and quiet environment in a room.

According to the Lead-Included Endpaper Association, an increasing number of endpapers are being used in a wide variety of applications, from residential to commercial.

The association notes that the use of lead-included endpapers is a relatively new development in the endpaper industry. It is a result of the growing concern for noise reduction in interior spaces. The association claims that lead-included endpapers can reduce noise levels by up to 10 dB.

Typical of such endpapers is a new product called "Lead-Included Endpaper," developed by the Lead-Included Endpaper Association. This product is made of a material that is designed to absorb sound waves and prevent them from reflecting off the walls and ceiling.

The association claims that lead-included endpapers can reduce noise levels by up to 10 dB. This is a significant improvement over traditional endpapers, which do not have this noise-reducing property. The association notes that lead-included endpapers are available in a variety of colors and patterns, making them a versatile choice for interior design.

The association also notes that lead-included endpapers are easy to install and maintain. They can be applied to a variety of surfaces, including walls and ceilings. The association claims that lead-included endpapers are a cost-effective way to reduce noise levels in a room. They are also a good choice for people who are concerned about the environment, as they are made from a natural material.

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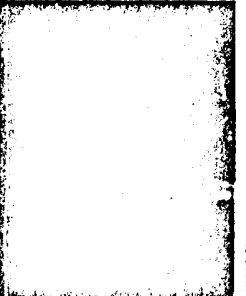


Photo Caption published in FACTORY
November 1, 1973

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

"Orlando Glasnost"

Feature article published in FACTORY

November, 1973

Photo Caption published in FACTORY

November 1, 1973

PLATE CIRCUIT
MANUFACTURING
ON PLATE

SEP

1973

CIRCUIT
MANUFACTURING

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, preheated soldering iron and a solder wire or bar. Today, the continuous effort by many industries to partially or completely automate production has brought many changes to 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 applications can join the preform preforms to the assembly. Such methods include hot-rod heating, induction or resistance heating, gas torch, oven or hot plate.

Various on-line basic preform shapes make up all the shapes available (Fig 1). These basic shapes include wire, You can fashion round, square, oblong and oval shapes from solid wire or flux-filled wire. Casting and forming the wire into shape is less expensive than and other solid shapes. Punched parts. Solid wire or flux-filled wire can form discs, washers, domes and oval shapes. Flux-filled discs require a solid portion to join the top and bottom of the disc.

Spherical shapes come only in solid.

Solder-coated metal forms. These preformed metal packages 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 20% 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 unit, you must provide for progressively lower melting temperatures at solder contact points within an area of 2 sq in to avoid burning the previous bond. In the first step, you resistance-solder the curves and end of the coil to the coil cover

using flux and rings composed of 95% lead and 5% silver alloy. This solder melts at about 685°F, and thereafter the joint parts joined, three glass terminals located immediately adjacent to the screen and grid, must be joined using a solder with a lower melting point. Ring preforms made from 63% tin and 37% lead, which melt at 361°F do the job. The final operation hermetically seals the oscillator cover. You make this seal with a preform composed of 28.5% tin, 28.5% lead 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 time-proven lead alloy solder preforms used in the electronic data processing industry are tiny chains of uniform size and length elements for the wires attached to a computer terminal block (Fig 2). The terminal block wires are 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 preforms have a 0.007" O.D. and a 0.040" I.D. You set the chain preforms by hand along every other one of the gold-plated contact pins to which the wires join. Because the preforms come in chain form, you can set a row of 24 pins at one time rather than resorting 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 "staggered pin" arrangement whereby one wire (the one with the lead alloy) serves as the electrical contact, while

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

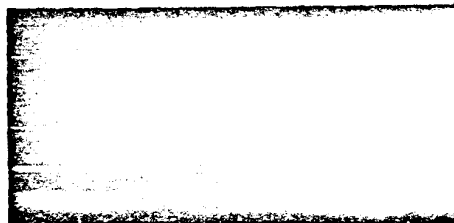


Fig 2 Chain preforms simplify the lead alloy solder preforms developed to solve joining problems encountered in the electronic and data processing industries. This chain preform is 63% tin and 37% lead alloy, permits rapid hand placement of preforms around the base of hundreds of tiny gold-plated square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



Fig 3 Typical circuit board die

Feature articles and Photo Captions

on Soldering Preforms appeared in:

CIRCUITS MANUFACTURING, September, 1973;

INSULATION CIRCUITS, November, 1973;

and DESIGN NEWS, November 5, 1973

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25-17 INSULATION/
CIRCUITS
NOV 1973

NOV 1973

LEAD IN
SOLDER

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 leading to increased use of the solder preform is the use of lead alloy preforms. These 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 materials. Alloy contents range from nearly 100% lead to as low as 30% lead. In most cases, the alloy is made with one of the most frequently used industrial 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 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 installed in a computer terminal block. Typical chain washers have a .100" OD and a .250" ID and they are made from 60 (60/40) lead-tin alloy. The chain washers are set by hand along every other row of binary-coded 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 joined to the pins with the 60/40 alloy along every other row because the terminal is wired in a "banded 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 voltage.

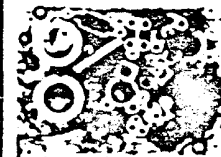
There are numerous other applications for lead alloy preforms ranging from air filters to wire mesh components, and in all cases their use results in time and money saved in assembly, elimination of solder waste, and an improved soldered joint. Preforms also permit the rapid joining of a wide variety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

41-76 DESIGN NEWS
VOL. 96, NO. 45

NOV 5 1973

LEAD IN
SOLDER

Solder Preforms



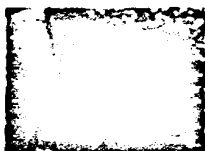
Manufactured solder configurations contain a fixed quantity of solid alloys with or without a flux core. Preforms produce solder fillets for specific joints in an assembly. They can be manually placed on the area to be soldered or they can be deposited automatically. Once in place, solder preforms are joined by any conventional heating method. Lead Industries Assoc., Inc., 297 Madison Ave., New York, NY 10017. For information, circle 394.

CASTING REVIEW AND NEWS

Unearthed Fragment Of Revolutionary War Statue Destroyed To Make Bullets



Close-up view of the 25-lb. lead fragment which makes up the head of the King George III statue which it was erected in 1776.



Lead fragment, the most common in lead, and the 25-lb. lead fragment of the King George III statue which it was erected in 1776.

A 25-lb. fragment of one of the most famous pieces of sculpture in American pre-revolutionary history has been unearthed in Winton, Conn., where it has been buried for nearly 200 years. The fragment is from a 1200-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 1776 at Bowling Green Park on the island of Manhattan.

The story of how the two-ton statue got from the island of Manhattan to Winton, 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 Winton - and shipped to New York

where it was unveiled in the summer of 1776. The 1200-lb. statue, the other classical Roman statues of the day, was complete with legs, sandals, 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 buy 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 citizens 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 the statue's neck and toppled him and his horse from the marble pedestal. The angry men 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 25 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 squashed lead was loaded into cannons and carried off to a military depot in Litchfield, Conn., where a lead half of it was melted down & bullets for the Continental Army. According to detailed records stored in Litchfield, the town made 42,000 bullets using lead.

Bullets cast in Litchfield account for only about half of the two 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, torso, the wreath, sandals made by way back to England. In 1822, other parts of the statue began appearing in Winton, 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 Winton swamp. Four large pieces weighing about 200 lbs. and including the horse's tail, part of the saddle, and what is believed to be a part of the horse was found. Part of the king's legs and the horse's foreleg were discovered a little later.

While it isn't known exactly how the pieces of the King George III statue became scattered around Winton, 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 25-lb. fragment of the statue that was recently unearthed at Winton is the only piece to have been discovered in more than 200 years. Louis Miller, a native of Winton, found the piece in a small house that is only about two miles from his home. He located the fragment with an electronic metal detector and its date as the marker that was placed the

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

Published in: CASTING ENGINEERING

July/August, 1973

1945

The International - September 1972

Lead is claimed to be the first amplifier in the UK to lead-on two-way and used in the roof truss of the new building in London of the National Institute for Research in the Sciences. The results of the first of the on-way air building reports the Lead Industries Association's personnel. Lead is in the form of an open frame consisting of 200 panels, each 2.5 m high and 1.5 m wide. They were fabricated from 20-gauge galvanized steel with a coating of about 15-20 g per square foot (0.023 lb/sq ft) of steel plate.

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.

Chaffed rail banded land 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-treated with lead alloy. The lead clad steel has been subjected to extensive mechanical and thermal testing without lead failure. It was first fabricated using traditional steel 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 standard for the domestic market because the companies wanted permanent export proportion for roofing, piping and chemical construction.

Lead acid stored is competitive to coal with other quality metal products used in the construction market, making the use of lead practical for these structures not considered. Some examples include barns and riding stables which have already been developed in England and roofing gables, doors, cupolas and ventilation equipment.

Most types of fasteners can be used to mechanically join lead coping steel. When decorative architectural joints are required to timber bottoms or other structural members, lead capping joints can be incorporated to provide a continuous lead surface. The use of lead capping joints also helps to waterproof the fastener and retain the pleasing appearance of lead throughout the entire frame.

A verapamil, self-adhesive paper coating is applied over the lead sheathing to protect it during handling, 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 of one of the new National Mutual Life Assurance

City of Australasia Ltd. This catenoid-shaped office building was designed by Gunn & Partners. Located to the City of London within the precinct of St. Paul's Cathedral, the new building, like the world famous cathedral, has a lead roof.

The beams of the roof of the six-story building is in the form of an open narrow compound of 200 panels. The panels, each 8' high and 14' wide, are installed vertically around the beams of the roof which lift the building itself.



TOP Partial view of the lead roof of the new National World Life Association of America, Inc. Building in London, England. The roof is made up of 104 corrugated panels, each covered with 1 lb. of lead in, thereby, thus lead, installed in perforated, supported rafters. 7 up flange of an adjoining building are visible at upper right. **BOTTOM** - Close-up view of typical roof panel that has been lifted to show 6" wide lead lap joint that runs across full line of 14" pitch roof.

is integral in shape. Because the heads of the panels are partially exposed to the weather, hand chiseling was applied to both sides of the panels. They were fabricated from 20 gauge two-piece steel with a coating of about 1 1/2 pounds per sq. ft. (LH55) (shale) on each side.

Industrial service equipment for the National Medical Life Association of American Life, building is housed on the top floor of the structure and 6 ft. air space that provision has been made for access through the roof at any point to facilitate equipment replacement and maintenance via helicopter. The roof was designed so that any point can be lifted and replaced without disrupting structural members. The roof design is based on the use of sandwich-constructed 3" plywood panels with a lining of aluminum board secured to the beam for improved fire resistance. The panels are fastened in a series of columns and shear connectors, similar to those found in floors, which are supported on beams.

The exterior face of the panels are covered in 8 lb. per sq. ft. (204-in. thick) sheet lead which was simply fixed to the face of the panels by returning the edges and nailing them to the back of the panels with copper nails.

Each side of the notogaster-shaped oval is about 15 mm long and each segment of the notogaster is made up of 60 puncta. They have a maximum width of about 7.5 mm at the sides and curve outward 7.5 mm length. The hip joints occur on the left of the 18th punctal row are 5 mm wide. The head is retracted into an anti-sagittary groove on the underside of the humping puncta. A second groove contains a compressible organ or an additional calcareous organ against penetrating rain.

Architects Newman, Levine and

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

Published in: AMERICAN ROOPER &
BUILDING CONTRACTOR

August/September, 1973

Also appeared in TIN INTERNATIONAL.

September, 1973

ABC, AUGUST-SEPTEMBER 1972

engineering essay

Removing lead from batteries

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



The battery industry is taking an increasing portion of lead consumption, now representing 46% of the total, and if all other uses, including laboratory lead, continue their past trend, batteries will represent over 51% of lead consumption by 1980. Despite the release of batteries as lead (and vice versa), however, we are constantly trying to take lead out of batteries, since lead is the largest single item in our manufacturing cost and is, therefore, the most fertile area for

potential cost savings. In the past, lead was removed through refinement of thinner plates or grids, and smaller connectors. The non-plate cover and the through-the-wall lead-weld construction 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 1962, 63% of battery lead was antimonial lead alloys. By 1971, it was 46%, with oxide making up the remaining 54%. By 1980, the ratio of oxide to alloy lead will have increased to 90% oxide and 10% 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. Presumably, it doesn't mean we are as much beyond this point, so at some point, although there will be some specialized cases, as there are now, where the ratio of oxide to hard lead is 75-25. Such an increase is forthcoming on technology, so I would prefer to stick with the 90-10 ratio as a guide. It must be remembered that this ratio is not accomplished by replacing grid material with oxide, but by just increasing grid metal.

Action needed. We anticipate that oxide use will amount to around 15-17 pounds per battery, but the grid lead will be reduced 30% to nine pounds per battery. At the time

industry grows, the hard lead requirement for battery grids will increase by 30% between 1971 and 1980, while the oxide requirements will increase by about 16%. Presumably, 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 antimony purity the requirement by the battery industry from the battery industry and the lead industry must prepare to provide the capacity needed to meet a 50% market increase.

A split of oxide saving representing 70-80% in-house capability is healthy and economically feasible for the battery industry. It is vital to be double-minded as there is protection against technological or other problems. At the same time, however, the "make or buy" decision inherent in the battery manufacturer that he should make his own oxide. The 70-80% split is oxide covering a well thought-out breakdown and one that affords both the oxide producers and the battery manufacturer the best of two outcomes. 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 365,000 tons per year.

Carbon alloys. Reduction in grid metal is being aided by the advent of carbon lead alloys, which yield much lower corrosion rates, allowing grid weight reduction without loss of efficiency. Carbon alloys are gaining importance with the introduction of the maintenance-free battery, and, while carbon lead is not new (industrial batteries have used it for many years), it is still true that in the auto battery, where this grid and high-speed production occur, carbon creates a whole new set of problems. For example, the main reason 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 approach will differ, but the end result will be to produce a thinner grid without the inherent problems of casting and handling carbon lead grids. These batteries will cause some problems in terms of casting. Any significant trend to batteries without antimony could affect the secondary lead producers, which, antimony, battery usage could lose its appeal and become a drag on the market. As a step when you go down, the net cost to the battery industry will go up, and secondary questions may have to effect their pricing to make out. The battery industry will then have to compensate for this. At least the situation will supply the secondary lead industry with some relatively pure lead to export. Presumably, we could buy the lead for grid metal from the primary producers and the lead oxide from secondary producers.

Ultra-high purity. Shortly content also comes up with carbon lead alloys. With some open as low as 0.001%, they cause some restrictions or certainly costly. The work supposedly comes grinding which makes the battery less maintenance-free and thus undesirable. Much work remains to be done, and by 1980, we probably won't recognize the carbon 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 casting and more competitive pricing.

— Dave H. on Product Service Card

Feature article: "Removing Lead From

Batteries", by J.A. Peterson

Published in: AUTOPRODUCTS

November, 1973

Chrome Yellow . . .

Part of the Answer to Traffic Accidents

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

LEAD CHROMATE paint will play a major role in two permanent marking programs that are key elements of a massive nationwide highway safety plan authorized by the Federal Aid Highway Act of 1972.

The two programs were developed to help decrease the staggering 16.4 million vehicular traffic accidents that resulted in 58,000 deaths, two million disabling injuries and more than \$13 billion in property damage in the United States during much of the last two years. The programs will cost nearly \$200 million—\$175 million for a Permanent Marking Marking Demonstration Program, which will begin in 1974, and \$25 million for a Temporary Marking Marking Demonstration Program, which also will begin in 1974.

Two-Phase Program

The Permanent Marking Demonstration Program authorizes the Secretary of Transportation to approve permanent marking demonstration projects on any two-lane road highway other than the Interstate System, in order to bring such highways up to marking standards issued or endorsed by the Federal Highway Administration. The program is primarily designed to meet the critical need to provide, for the first time, sufficient initial funds to begin thoroughly marking road two-lane roads where two-thirds of the nation's highway fatalities occur.

The Temporary Marking Research and Demonstration Program, on the other hand,

was developed to conduct research and demonstration projects to improve the effectiveness and durability of various types of permanent markings and related techniques. The program also will develop improved equipment and techniques for applying, covering and maintaining such markings and techniques during adverse weather and conditions during construction.

Save in Long Run

Traffic control studies such as permanent markings can prevent thousands of accidents and subsequent deaths, injuries and property damage annually. For example, if all highways and streets in the U.S. were properly marked, it is estimated that from 1,000 to 2,000 lives could be saved and from \$5,000 to \$10,000 injuries would be avoided each year. It also is estimated that the permanent markings would save \$2.5 to \$4 for each dollar it costs to apply such markings. The difference in material and labor factors is due to the fact that Federal, state, urban and rural roads each have different highway marking rules—road rules, for example, recommended by 60 per cent of the highway traffic deaths during the 1971 period. It is for this reason that the Permanent Marking Demonstration Program gives priority for handling permanent markings on such roads.

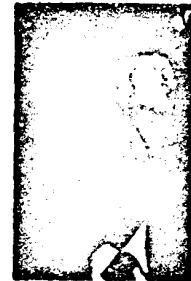
Inter, business and district roads and double center line permanent markings are the most frequently used to prevent highway traffic accidents. They include "passing" and "no passing" and "proceed with care"

two" signs and, even though they are known to make lane markings, such markings are not always in the proper position or position. In addition to such permanent markings, solid line permanent markings also are used to mark the edges of streets and highways where there is no shoulder area or to the left of the line for disabled vehicles or for making emergency stops.

"Highway Yellow"

Three types of permanent markings and others, such as such markings and signs, have to be highway highway clearance, are painted "highway yellow." A special color marked, highway yellow has been specified by the 1971 National Highway Traffic Control Device (NCHD) for all temporary highway traffic control devices, including signs. The paint program that must comply with the standard highway yellow color requirement, as well as any requirements, is lead chromate, or "chrome yellow" paint. Yellow is the most visible color to the human eye from among all colors in the color spectrum.

In addition to marking the color standard, for highway yellow, chrome yellow paint also provides many other important qualities that make it the most versatile, longest lasting and most economical for all temporary traffic control devices. For example, chrome yellow paint also has good resistance to degradation by light and is resistant to abrasion and to various gases and air-borne pollutants.



Philip E. Salzman

Look of Proof

The UTCD Manual is intended to serve as the regulatory document for installing traffic control devices such as permanent markings on all streets and highways in the United States. However, there is a major problem in implementing and complying with the Manual as a regulatory book. There just isn't 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 was built, and how it is being maintained.

Of the nearly two billion miles of paved streets and highways in the U.S., only 600 thousand miles of Interstate, state and primary and secondary primary and secondary roads were built with Federal aid funds. In order to qualify for such funds, such roads were constructed by private contractors in accordance with the UTCD Manual. During

Friday, November 16, 1973

such construction, the various states issued a variety of permits to supply work requirements for the payment of all such work. The states and the Federal Highway Act of 1973 is to implement the first two years, studies and studies guidelines will not be met. It is at least known the states program that will be required to comply with the 1973 UTCD Manual.

The following data gives some indication of the resources that would be required for the first phase of the permanent marking program. It is estimated that 600 thousand miles of two-lane roads, 2.5 percent yellow, center markings and the rest will be approximately 100 million. It is estimated that 125 million will be required to apply "no passing" permanent markings. Approximately 800 thousand miles of yellow will be placed on primary and secondary two-lane roads at a cost of \$10 million.

Federal Funds

That it is now to see why the nearly \$200 million allocated by the Federal Highway Act of 1973 is so important. For the first two years, studies and studies guidelines will not be met. It is at least known the states program that will be required to comply with the 1973 UTCD Manual.

The following data gives some indication of the resources that would be required for the first phase of the permanent marking program. It is estimated that 600 thousand miles of two-lane roads, 2.5 percent yellow, center markings and the rest will be approximately 100 million. It is estimated that 125 million will be required to apply "no passing" permanent markings. Approximately 800 thousand miles of yellow will be placed on primary and secondary two-lane roads at a cost of \$10 million.

Feature article: "Chrome Yellow...Part of the Answer to Traffic Accidents"

Published in: AMERICAN PAINT

JOURNAL CONVENTION DAILY

November 16, 1973

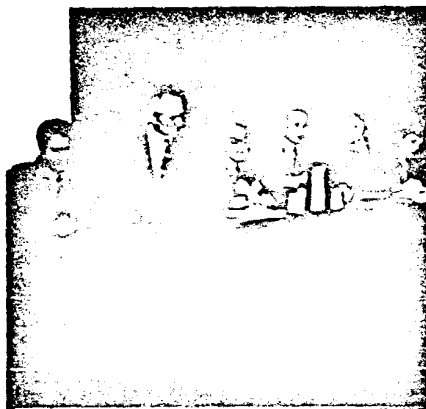
OCT 1973

Keeping trend with growing interest in the breeding and exhibiting fields and based on the success of the AWS-WRC Fourth International Breeding Conference and the AWS Second International Exhibiting Conference held this past April in Chicago, the association has decided to add a new event to its calendar. Third International AWS Exhibiting Conference and a Fifth International AWS-WRC Breeding 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 Newton, Texas during May 6-10, 1974.

On this occasion, papers by both USA and foreign authors will be presented on brining and soldering applications and brining 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 66th Annual Meeting and 1973 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 Brazeing Conference.

The Strategic Communications Survey by the AVE Commission on Branding and Sloganeering as a result of the need to promote knowledge and information in these fields which were covered throughout a number of sessions and publications. Also important was the fact that the number of applications for the program had 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 brand and slogan design had, likewise, become more stringent. In brief, designs are engineered to perform as an advertisement, to perform with marketing reliability by the consumer, slogan, slogan.



A panel of subjects answered questions from the audience and gave informal presentations on environmental safety and industrial and professional responsibilities and issues to the highly enthusiastic Junior Fraternity and Sorority Conference members held this past April in Chicago. Featured were Bill to Right and Missions, R. Bland, Archbishop Coyle; R. B. Kennedy, Kaiser Steel; A. M. Swenson, Honeywell; M. H. Heston, J. R. Furr, Allen, & Lyons, Little Industries, Inc.; and R. L. Rice, Corning.

and other equally sophisticated industries. In considering 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.

Through annual bracing and bolting conferences, the Bracing and Bolting Committee hopes to centralize 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 bracing and bolting.

The Fifth International Breeding Conference and the Third International Soldering Conference

promise to be even better than the previous ones. The AWS Committee on Braze 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

61-4 WELDER
JOURNAL
NO. 24, 1973

NOV 1973

LEAD IN
MAGAZINE

1972 Annual Review of Lead Industry

The Lead Industry 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 of the 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 Industry
Association, Inc.

61-4

61-26 PRODUCTION
MAGAZINE
NO. 24, 1973

NOV 1973

LEAD IN
MAGAZINE

A 34-page report by the Lead Industry 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 Industry Association, Inc.)

Publication No. 408 on Card

Subscription November 1973

61-34C 33 MAGAZINE/MAGAZINE OF
METALS PRODUCTION
NO. 24, 1973

OCT 1973

LEAD IN
MAGAZINE

Lead Industry Review From, 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 Industry Association, Inc.,
282 Madison Avenue, New York,
N.Y. 10017

61-17 ELECTRICAL
WORLD
NO. 24, 1973

OCT 1 1973

LEAD IN
MAGAZINE

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 Industry Association, New York, N.Y. Charts and graphs provide 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 a list of research and development projects conducted by the International Lead Zinc Research Organization, Inc. Tables at the end of the report summarize world lead situation on these products, or lead production, and related consumption.

Subscription price \$5.00

61-17 METAL PROGRESS
NO. 24, 1973

OCT 1973

LEAD IN
MAGAZINE

Lead Data

The 1972 Annual Review of the U.S. Lead Industry contains reports on lead consumption by market, lead production, the free world lead situation, and R&D research and development projects. 34 p. Lead Industry Assn. Inc.

61-17 METAL PROGRESS
NO. 24, 1973

SEP 24 1973

Lead Review
of Lead Industry

The Lead Industry Association, Inc., 282 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.

THE BATTERY MAN, November, 1973

WHO WHAT WHERE

61-17 METAL PROGRESS, INC.

The Lead Industry 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, Inc.

Tables at the end of the report summarize world lead situation on these products, or lead production, and related consumption.

Free copies of the U.S. Review, 1973 can be obtained from the Lead Industry Association, Inc., New York, N.Y.

61-17 METAL PROGRESS
NO. 24, 1973

OCT 1973

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

Subscription price \$5.00

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

PRODUCTION, WELDING DESIGN & FABRICATION,

PRODUCTION MAGAZINE, and WELDING JOURNAL.

Lead for radiation shielding has come a long way from the weighty black waste your parent used to wear when x-raying teeth. With the rapidly increasing use of nuclear medicine, lead shielding has become necessary in various types of medical equipment and environments. From the Lead Industries Association is offering information on the latest applications of lead radiation shielding. **Circle 208**

INDUSTRIAL DESIGN/NOVEMBER 1973

3-4 ARCHITECTURAL FORM

NO. 35,000

AUG 1973

LEAD-IT
BACON

Lead Industries Association Inc., an 8-page booklet entitled "Lead As A Modern Design Material" discusses properties, forms, and its use in construction of lead-based and non-lead materials of various types such as architectural, such as decorative elements, window treatments, and building structures. Lead Industries Association, Inc., 100 Madison Ave., New York, NY 10017. For more details, circle 206 on reply card.

41-78 INDUSTRIAL DESIGN

NO. 35,000

OCT 1973

LEAD-IT
BACON

Sound control
Lead Industries Association Inc. offers its Spring 1973 issue of Lead magazine which reviews 12 problem-solving applications involving lead. Featuring a variety of lead sound control applications, this issue includes information on the use of sheet lead to solve problems in a power plant, aboard a fleet of jet-powered commuter ferries, in office buildings, and for industrial machinery designed to meet OSHA noise control requirements. The contributions of sheet lead in safety applications are also pointed up in two articles. One discusses lead's role in luggage screening devices. The second article discusses the use of lead to shield medical and other personnel from the effects of radiation encountered in nuclear medicine cancer detection. The magazine also lists technical literature currently available from the association. **Circle 247**

51-9 FIBER

NO. 37,300

NOV 1973

LEAD-IT
BACON

Sheet Lead Noise Barriers
("Practical Applications of Sheet Lead for Sound Barriers") includes test curves that show lead materials—Lead Industries Association Inc., Circle 206 on CARD-INFO Card.

41-57 MAINTENANCE ENGINEERING

NO. 35,000

OCT 1973

LEAD-IT
BACON

Noise Barriers
The practical applications of sheet lead for the purpose is discussed. The publication points out that lead can be used in sheets, in lead panels, in our case as a sound proof, laminated to plastic for enclosures, and attached directly to heavy machinery. The brochure discusses a series of sketches of lead-bearing partitions at hospitals, with test curves showing sound barrier capabilities of each type of construction. Lead Industries Association, Inc., Dept. ME, 292 Madison Ave., New York, NY 10017. For more details, circle 236 on reply card.

51-17 METAL PROCESS

NO. 35,000

NOV 1973

LEAD-IT
BACON

Centrifuge Effects
Rotating particles smaller than 1 micron from liquid spraying with this economical efficient centrifuge system. A.S. Lead Industries Association, Inc. **Circle 209**

Sound Barriers
Technical publications discuss the "Practical Application of Sheet Lead for Sound Barriers." Bulletin 13, 12 p. Lead Industries Association, Inc. **Circle 210**

51-17 METAL PROCESS

NO. 35,000

OCT 1973

LEAD-IT
BACON

Lead Bar
Booklet, "Publications and Films" list more than 60 current literature and monographs on the properties and applications for lead and its alloys. 12 p. Lead Industries Association, Inc. **Circle 211**

41-12 MATERIALS ENGINEERING

NO. 35,000

SEP 1973

LEAD-IT
BACON

Materials

Literature

Metals

Sheet lead noise barriers. Discuss applications of sheet lead for sound barriers. Includes sketches of lead-bearing partitions or terminals, and test curves showing sound barrier capabilities of each type of construction. Lead Industries Association, Inc. 1984 4-73 Circle 205

SOUND AND VIBRATION

DAY VILLAGE, OHIO

CHARTER 10,000

AUG 1973

Cost lead for noise barrier applications
An 8-page brochure "Practical Application of Sheet Lead for Sound Barriers" has been released. A series of sketches of lead-bearing partitions for hospitals accompanied by test curves are included. The architectural sketches facilitate pricing and enable the user to specify the construction techniques. Lead Industries Association, Inc., New York, NY.

Circle 203 on Reader-Service Card

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"

W. J. GIBSON
W. J. GIBSON
AT EL. 971, ONE, ONE
BOLTON 1428

OCT 29 1973 (LITHO)
BACON

Electric Vehicle Expo Feb. 19-24

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

The Electric Vehicle Council and the International Union of Producers and Distributors of Electrical Energy are sponsoring the Third International Electric Vehicle Symposium, as well as the exhibit. Both will be held simultaneously at the Madison Park Hotel.

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

A session on electric vehicle systems will be led by Robert L. Harwell, assistant director, Office of Systems Engineering, Department of Transportation, on-the-road vehicles by William H. Baker, staff engineer, Commonwealth Edison Co., electric vehicle components by Dr. Victor Frank, president, Petro-Electric Motors, Ltd., and off-the-road vehicles by Charles A. Baker, Jr.

Technical service segment 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.

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SEP 10 1973 (LITHO)
BACON

Letters to the Editor

BRIEF COMMENT

Dear Sir:
In the West Britain article covering the EV Battery Co. (FAME, Aug. 29), it is stated that "limited use of lead in paint, pesticides, agriculture, plastics, medicine and other compounds, now comprises only 1.8% of total lead."

This figure is not known and is estimated from 1972, 700,000 tons of lead was used, while in the battery market, batteries contained 730,000 tons last year, 1,67,000 tons in 1971, which, when compared to industrial production, is the source for battery applications.

Lead Industries Association's estimate for the first 6 months of the year was 114,000 tons going to the battery field out of an estimated 713,000 tons used in the six months period.

PHILIP E. ROBINSON
Executive Vice President
Lead Industries Association, Inc.
292 Madison Ave.
New York, N.Y. 10017

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SEP 1 1973 (LITHO)
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COMPETITION ANNOUNCED FOR METALLURGY OF LEAD

The Lead Development Association, London, England, has announced that the Mademann 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.

Papers, consisting of a model, certificate and cash award of \$400 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.

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NOV 1973 (LITHO)
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Lead Industries Assoc. Elects Officers

D. R. Cray, executive vice president, Ft. Lee 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. Raynor, Ethyl Corp.; J. F. Robinson, Ethyl Corp.; and J. G. McConaughy, Amas Lead and Zinc, Inc. L. E. Gage, director of communications for LIA, was elected to the additional post of assistant

secretary. P. E. Robinson was elected as executive vice president. J. F. Patrick, secretary and general manager, R. J. O'Hara, treasurer and Mrs. D. L. Moore, comptroller and assistant treasurer.

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OCT 1973 (LITHO)
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Lead and Zinc Officers Elected

Recently elected officers of two important mineral associations—the Zinc Institute, Inc., and Lead Industries Association, Inc., are as follows:

Zinc Institute: D. D. Brown, executive vice president of A. S. & B. Co., president and chairman; J. R. Alexander, N. J. Zinc, Inc.; J. C. Dumas, Co. Inc. (Michigan Corp.); R. D. Mathews, (Iowa Corp.); and president, R. J. O'Hara, (Iowa Lead & Zinc, Inc.) treasurer.

Lead Industries Assoc.: D. B. Cray, executive vice president of Ft. Lee Minerals, president and chairman of the Board of Directors; T. M. Raynor, (Ethyl Corp.); J. F. Robinson, (Ethyl Corp.); J. G. McConaughy, (Amas Lead and Zinc, Inc.); and L. E. Gage, director of communications for LIA, was elected to the additional post of assistant

Lead Industries Personnel Announcements...

"Lead Industries Association Elects Officers",

and announcements of LIA's participation in such industry-related projects such as:

Mademann Memorial Prize Competition, Electric Vehicle Exposition, and a Conference on Childhood Lead Poisoning.

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Environmental Engineering Problems in Industrialized and Developing Countries will be held Sept. 19-20, in New York City. For further information, contact Conference Manager, World Federation of Engineering Organizations, 11 Place, London WC2E 0RL, England. Edited proceedings of the conference on childhood lead poisoning, held recently in Chicago and Wilmington, Del., is available to physicians and public health workers, from J. F. Cole, Lead Industries Association, Inc., 292 Madison Ave., New York, N.Y. 10017.