



Lead Industries Association, Inc.

252 Madison Avenue • New York, N. Y. 10017 • Telephone: (212) 679-8088

December 28, 1972

SUBJECT: PUBLICITY STATUS REPORT

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

Attached is the Fourth Quarterly Report on LIA's Publicity Program for 1972. We are pleased with this effort, which for 1972 has produced the following:

- 35 - Feature Articles Completed
- 44 - Feature Articles Published
- 119 - News Articles Published
- 23 - Editorial Request Responses

As before, photocopies from our publicity proofbook for this quarter are also attached.

Sincerely,

Jerome F. Smith
Secretary & General Manager

JFS:lm
Attachment

December 1972

LEAD INDUSTRIES ASSOCIATION
TRADE PUBLICITY PROGRAM
YEAR-END REPORT
September - December, 1972

Highlights of current publicity projects discussing lead applications.....in ARCHITECTURE:

* Features on lead sound barriers at.....

Hampton Mews, East Hampton, N.Y. - a feature article discussing the use of sheet lead to solve noise problems in an apartment complex was published in AMERICAN METAL MARKET and APARTMENT CONSTRUCTION NEWS.

* Features on lead roofs at.....

The Bellport, L.I., High School and the Arts and Drama Center at Baldwin-Wallace College, Berea, Ohio -- a feature article published in ENGINEERING NEWS RECORD.

The following articles discussed the use of lead in BATTERIES:

- * Lead Acid Batteries Show Strong Growth Potential - a special feature published in the special battery supplement, AMERICAN METAL MARKET.
- * Electric Powered Truck Due For Wichita Test - Interview with Connel Baker of LIA in Wichita (Kan.) Beacon.
- * Lead Acid Battery Proves Itself in Knitting Mill - Feature article discussing the use of electric fork lift truck to solve corrosion and environmental problems in N.C. Knitting Mill - Published in AMERICAN METAL MARKET and TEXTILE WORLD.
- * Battery-Powered Trucks Provide Economy, Safety - Feature Article published in INDUSTRIAL MAINTENANCE & PLANT OPERATION.

The following applications discussed the use of lead for
NOISE CONTROL:

- * Sound Control Materials Let The Sound of Silence Be Heard - Special three-page feature article prepared in cooperation with the editor of PRODUCT ENGINEERING.
- * A feature release discussing the use of lead in a newly developed machinery noise enclosure panel was published in AMERICAN METAL MARKET, MACHINE DESIGN, IRON AGE and DESIGN NEWS.
- * A summary of lead applications involving noise control was published in AMERICAN METAL MARKET and THE MINING JOURNAL.

The following feature release discussed the use of lead in
PAINT:

- * Proposed Nationwide Highway Safety Program To Increase Use Chrome Yellow Paint -- feature article published in AMERICAN METAL MARKET.

A special feature on the use of lead for stained glass applications was published in.....

- * The NATIONAL GLASS DIGEST

The following literature availability announcements were published:

- * Facts About Lead Glazes -- published in 4 magazines.
- * Lead -- As a Modern Design Material - published in 6 magazines.
- * 1972-75 Free World Supply and Demand of Lead & Zinc - published in 14 magazines --- NOTE: Four of the magazines used the publication to prepare an in-depth report.
- * Lift Profits Electrically -- Published in 11 magazines.
- * Lead Applications for Sound Barriers - published in 2 magazines.

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Watch for publication of the following recently distributed feature articles:

- * World Trade Center Construction Results in Four Record Uses of Sheet Lead
- * Newly Developed Machinery Noise Control Enclosure Takes Advantage of Sheet Lead's Acoustical Properties
- * Proposed New Nationwide Highway Pavement Marking Program To Make Major Use of Chrome Yellow Paint

.....and for publication of the following articles which are being readied for distribution:

- * New Noise Control Panel Developed To Solve Sound Attenuation Problems at Long Island Lighting Company Features Extensive Use of Sheet Lead
- * Leaded Vinyl Plays Important Role In Solving Noise Problems For Grumman Aviation's Gulfstream II Executive Jet and Experimental Tracked Air Cushion Vehicle
- * Increased Use of Radioactive Material To Treat and Detect Cancer Result in Expanded Use of Lead to Shield Against Harmful Radiation
- * New Lead/Zinc House Planned

Fourth Quarter
Summary of Publicity Activities

Feature Articles published.....	10
News articles published (including literature availability announcements).....	32
Feature Articles Completed.....	4
Feature Articles in Preparation.....	6
News Releases Completed.....	3
Editorial Request Responses.....	5

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11.21 APARTMENT CONSTRUCTION
NEWS
NOV. 11, 1972

SEP 1972



FACE 11.21 NOV. 11, 1972. The building of Hampton House, a new building, had out of 14 stories moved out during the first year of occupancy and developer. The building engaged several consultants to solve the problem. The floor through apartments and around they duplexes are now totally moved and right has had an operation to get the 14 units in completely.

Sheet Lead Solves Apartment Sound Attenuation Problems

East Hampton, N.Y.—When one out of the first 14 stories in Henry Bette's Hampton House apartment and townhouse complex moved out during its first year of occupancy complaining of excessive noise, the developer engaged the services of an acoustical consultant to solve the sound problem before the rest of the building was thrown completely out of order.

In every other way the units were a model design. Located in a country-like setting in the heart of the apartment complex, each unit was a two-bedroom, two-bath, two-level high construction being done from private services and separate owners. The

first building of the three-building complex contains a row of eight one-bedroom apartments at ground level and a second-story duplex apartment that is reached via an outside stairway between each unit.

The noise problems were caused by a number of factors, some of which were thought to result in sound transmission performance when the first unit was built.

The wood structural system used to construct the building and the materials used for the floor of the second-story duplex apartment resulted in the creation of a drumhead that stretched across the second floor area of the 14 apartments in the building. The drumhead effect magnified the slightest sound.

As the first way to solving the sound attenuation problems, several units were M.J. Korman & Associates tested the sound level transmission of second-story flooring in the apartments. It consisted of two layers of 1/2-in. thick plywood and a layer of 1/2-in. thick gypsum board added to 2-in. thick concrete with a layer of 1/2-in. thick plywood in between the joists. The construction had an STC rating of 24, level at which sound speech is almost audible.

According to James Wall of M.J. Korman & Associates, the required construction improvements could be achieved by installing three 1/2-in. (1) 1/2-in. thick sheet lead over all second-story floor joists of one apartment except for kitchen, bathroom and bedroom areas. First, existing carpet and underlayment in bedroom areas were removed. Soundboards and floor joists were then removed and the sheet lead was stretched and brought right against finished wall surfaces.

The sheets were lapped so each side joint and individual pieces were a foot in all floor areas. The lead was turned up slightly against all vertical surfaces to protect the integrity of a barrier and then the soundboards and floor joists were replaced. Existing carpet underlayment and carpet were then installed over the lead.

In the living, dining areas, the sheet lead was laid down over the old floor installed when the first building was constructed. Insulation caps were placed on these used in the bedrooms. New carpet was then installed over lead.

After the lead sheet barrier was installed, the flooring achieved an STC rating of 29. According to the acoustical engineers, at this level sound speech is barely audible.

SHEET LEAD SOLVES SOUND ATTENUATION PROBLEMS FOR LONG ISLAND APARTMENT COMPLEX

Published in APARTMENT CONSTRUCTION NEWS



PHOTO 11.21 NOV. 11, 1972. The building of Hampton House, a new building, had out of 14 stories moved out during the first year of occupancy and developer. The building engaged several consultants to solve the problem. The floor through apartments and around they duplexes are now totally moved and right has had an operation to get the 14 units in completely.

APARTMENT CONSTRUCTION NEWS

BUILDINGS USE LEAD TO FIGHT NOISE POLLUTION

Published as the result of a
editorial request from:
ENGINEERING NEWS RECORD

Buildings use lead to fight noise pollution

Can sheet lead used largely ignored as a construction material because of cost, is making a comeback because of its sound attenuating qualities as architects seek ways to reduce noise inside buildings.

At the recently constructed Arts and Deans Center at Baldwin Wallace College, Berea, Ohio, dormitory under a glide path into Cleveland's Hopkins International Airport, the lead system used lead sheet to provide a sound barrier.

The road over the center's two-stage roof about vertically to cover a large lot. It was covered with 1/4 in. thick, 1.5 lb. per sq. ft. lead sheeting backed with layers of building felt, rigid insulation and plywood. According to a spokesman for architect Howard Miller Wilkenson Inc., Cleveland, the noise attenuating requirement forced a choice between a concrete slab roof or sandwich-type roof using lead on all exposed surfaces. The sandwich construction, installed for about \$5 a sq. ft., required no backing up of columns or footings.

Sheet lead is also finding a use in new construction to form plenum barriers



Thicker lead used for sound barrier

above the ceilings to stop noise from moving from one room to another. For example, at a major addition to a prison high school in B-100, N.Y., lead sheeting was suspended from roof support girders at right angles to the long ceiling. By placing it above main load-bearing walls and partitions, acoustical consultants claim the amount of noise moving from one room to another through the space above the ceiling is sharply reduced. In schools, the lead sheeting has been placed above the tracks of folding classroom walls for sound attenuation when the walls are unfolded and in use.

batteries

section

More Thrust for Lead-Acid Power 2A
 Lithium Progress Creating Market 2A
 Battery Research Needed 7A

SECTION TWO OF AMERICAN METAL MARKET - TUESDAY, NOVEMBER 21, 1977

AMERICAN METAL MARKET

Article published in
 special Batteries Section
 as the result of editorial
 contact

Lead-Acid Batteries Show Strong Growth Potential

By LEAD INDUSTRIES ASSOCIATION

NEW YORK — In 1976 the industry forecast an annual growth rate of 8 percent a year over the next five years for industrial lead-acid batteries, which includes traction and stationary types. For the first year, 1977, this rate was almost exactly achieved, lead tonnage rates surpassing something more than a 3,000 ton gain over the previous year. (The tonnage figure has nearly doubled in the past 10 years.) This predicted gain was largely due to the increased use of electric power in plant vehicles, recognized now as viable in many more applications due to improvements in battery and vehicle technology.

However, in 1976, two factors were not calculated in the forecast: Environmental pressures and the introduction of large "floating" computer back-up systems.

In the first instance, the growth of the electric industrial truck over the internal combustion engine variety has accelerated far beyond expectations, due in large measure to new Federal standards on air quality control.

The largest truck manufacturers now report for the first half of 1977 that industrial truck production is running only about two 14" engines for one electric, whereas three years ago the ratio was four to one, 14" over electric. It is estimated that

this will bring the growth gain in lead batteries in 1977 to as much as 12 percent over last year with no proportion as yet for beyond.

Although no tonnage figures are available at this time, the new uncorruptible power systems (UPS) technology is becoming a factor in the use of lead for batteries. As much as 80 tons goes into one of these installations which have become vital to data processing and computerization of critical control methods.

Since infinite reliability is a necessity in these applications, batteries are utilized to "float" the mechanism, whereby cycle frequencies and voltage fluctuations — more and more a problem with mainline AC sources — can now be controlled within the required extremely narrow limitations. There is no specific forecast for this field, but the hype is quite apparent. The need can only grow.

Also it is worth mentioning in this category that lead acid

batteries are serious contenders in another new application: Peaking power. In this consideration, batteries will be used in power distribution centers and pumped storage plants for buffering power supply at critical demand periods, having been charged during off-peak hours. However, it is too early to speculate what this might mean in the marketplace (grainage huge requirements) pending further R & D.

SLI Category Gaining

Of the almost 550,000 tons of lead used for total battery production in the United States last year, the major portion went into the starting, lighting, ignition battery (SLI) category. Nearly 50 million units were produced in 1977 — including original equipment — and the conservative forecast is 60 million by 1980.

Not all of these, however, are for autos.

New starting uses in power boats, lawn mowers, trail bikes and the phenomenal snowmobile market brought brand new demands on battery production. In this area, also falls the new "electric car" battery, a re-configuration and improvement of the former golf car battery which powers the electric lawn and garden tractor now being popularized by at least two major manufacturers. Of course, the present electric golf car population in the U.S. is about 140,000 units each one requiring 8 — 6 volt batteries for traction. Replacement units here are viable and new sales annually run about 8,000 units.

Unquestionably, the future for lead batteries is a bright one.

AMERICAN METAL MARKET

second article published
in special Batteries Section
as the result of editorial
contact

Storage Battery Profile

The U.S. lead acid battery industry is composed of over 80 manufacturing members belonging to the Battery Council International. An additional 40 or so foreign battery makers are members, plus those firms supplying the battery industry with raw materials, and those marketing its products. Some important producers do not belong to BCI.

SUPPLY. Over 40 million replacement batteries are forecast for 1972, compared to actual output of slightly over 38 million S&I (starting, lighting, ignition) units last year. The total figure has grown every year since 1968 and is expected to continue in that direction. The forecast for 1973 is 43 million replacement batteries, almost 46 million by '74, 47 million by '75, and just shy of 48 million units by 1978.

The automotive battery market continued to improve in 1971, although it did not show the rate of increase during previous years. First quarter and fourth-quarter statistics are most significant, primarily because of extremes of cold weather during those months. Second and third-quarter results are relatively stable.

First quarter 1972 showed an overall increase of 16.7 percent in shipments.

DEMAND. There is little, if any, slackening of batteries. Demand is generally synchronized with production, as the business is closely monitored and maintained. Forecasts of annually increasing battery production are based on estimates of end use demand.

Better battery technology — resulting in longer life batteries — is not expected to reduce the annual demand. New vehicle production, peaking every year, will mean more batteries, even though replacement time will lengthen.

FOREIGN TRADE. Almost \$12.5 million worth of 8 and 12 volt batteries were imported by U.S. manufacturers last year, or about 930,000 units. Exports have grown every year since 1966, but the rate should taper off in the years ahead due to a build-up of foreign know-how and the

(Continued on page 8A)

Storage Battery Profile

(Continued from page 1A)

evolution of foreign automotive industries.

In 1971, the United States imported almost \$10 million worth of lead acid storage batteries and parts. That figure should not change too much in the years ahead.

RARE MATERIALS. Lead is the heart of the lead acid battery. In 1971, battery makers consumed over 280,000 tons of antimony lead, plus a sizeable tonnage of lead oxide.

The storage battery is the one bright spot for lead producers. Growth of the battery industry is expected to pick up the slack caused by the phase-out of lead from gasoline.

There are no serious hopes forecast for lead supplies to the battery industry. As it is, about half the total available lead supply in the United States is a result of secondary (recycled) production.

In the battery industry the trend appears to be for manufacturers to build new and larger lead smelters of their own, thus becoming less dependent upon outside imports or the primary lead producers. Orits for integration into plastic casing manufacturing.

A more fully integrated battery manufacturing industry would also be a hedge against unexpected price fluctuations for raw materials.

USES. The conventional lead acid storage battery is the standard for private automobiles, trucks, government vehicles, golf carts, snowmobiles, motorcycles and smaller vehicles. With increased recreation time, more and more recreational vehicles are being produced and sold. As the engines powering these vehicles grow larger, so will the demand for the storage battery.

OUTLOOK: Electric starting of all types of vehicles is here to stay. The larger the vehicle or the engine, the more batteries it needs or the larger its power requirements become.

The 6-volt automotive battery is fast going by the boards altogether, with emphasis on the larger, more powerful 12-volt variety.

If the age of the electric vehicle is in the offing, the battery industry will be one of the first to reap the rewards.

—KENNETH W. CLARFIELD

SEP 27 1972

ELECTRIC-POWERED TRUCK JUE
FOR NICHIA TEST ---ELECTRIC
VEHICLE ADVANTAGES CITED

Article published in Wichita
Beacon, Wichita, Kan., as the
result of interview with
Connel A. Baker, Jr., LIA staff



KCE will get electric van like this.
Vehicle is to be part of nationwide test by utilities.

Electric-Powered Truck Due for Wichita Test

The laminar rear end around of the motor's combustion engine will give way next year to the great wheel of an electric motor in a service vehicle K&A-E. The Electric Co. has coming in out in Berlin.

RG&F will receive one of more than 700 of the electric cars being built as part of a two-year testing and developmental program under the sponsorship of the Electric Vehicle Council.

THE TRUCK used in the graduation program will be powered by a 30-hp tractor engine and two sets of batteries. Our men can replace the two sets of batteries with freshly charged ones in five minutes. A single charge will operate the van up to 60 miles.

A BGA&E official said the local utility company's role at the time is two-fold — to learn what kind of facilities will be needed in the future to serve electric vehicles and to develop operating experience with electric trucks under normal working conditions to help advance technology.

THE FEDERAL Power Commission predicts there will be 25 million electric

data from the operation of the test which will be used as EGE's first will help the firm in planning to meet the electrical needs of electric units, a construction unit.

The A-C-E was well accommodated a driver and our passengers, plus a 1,000 pound payload in the rear cargo compartment. The truck will be 145 inches long, 28 inches wide and 22 inches high. A Pennsylvania company is producing the unit.

The Electric Vehicle Council is a national association of owner-leased electric light and power companies.

LEITH BARNES
- James Butler

electricity are vital factors in the electric vehicles for business and industry. On a national and local level, the electric vehicle is the Lead Industries Association's slogan and economy of advantage electric is how now these electric vehicles engines like of the vehicle, the electric power the economy of (no combustion) vehicle. The electric vehicle should electric vehicles over the

Y New York City, was an
 1000 at an electric vehicle
 by Broadway Motor. The
 designed to provide three
 in developments at the time
 in vehicle sold
 not the development of elec-
 her street cars and
 on getting underway. The
 of motor-act vehicle for
 own and industry has proven
 the electric vehicle to need
 if the initial cost of ownership
 higher but, over the life of
 it is a better buy than a
 gasoline vehicle.

to 65 per cent lower than the starting value." He also refers to the "unemployment" caused

NOTES show it has been caused by the electric vehicle of the major problems with the K-vehicle by business or the need

gas - is now under strict
control.

...under the pollution control act," he added. "It is not under the pollution control act that the government has been taking action on the pollution damage caused by electric vehicles used in industry and for agricultural areas where carbon monoxide is dangerous," he added.

SAID electric vehicles cost at three cents per hour in summer interval running. "Thus in regard to the type of IC vehicle used," he said, "it is not correct that factories in Tokyo are damaged by increased use of electric vehicles in short runs."



100-443887-100

Baker demonstrated one model of a non-strict electric system. Runners and Indians urged to use battery powered equipment.

"The industrial sector as a whole is three vehicles have a service life of seven years," he said. "This line can be extended up to 10 years with proper care and maintenance."

REPORT OF THE COMMISSIONER OF THE GENERAL LAND OFFICE

1125 INDUSTRIAL MAINTENANCE &
PLANT OPERATION
14, 1972

SEP 1972

1125

Battery-Powered Trucks Provide Economy, Safety

Efficient material handling plays a major role in the success of a modern plant, and industrial trucks are an important part of the material handling system. They lift, load, move, stack and transport goods and load banks in the chain of production and distribution. In recent years battery-powered trucks have gained in popularity, and have a lot to offer.

Efficient, Long Operating Life

Battery-powered trucks are said to provide a superior operating economy due to longer life, lower maintenance and a higher rate of equipment utilization. Specific factors that contribute to this economy include low cost



Operator shows maneuverability as his battery-powered truck demonstrates its ease of use in moving heavy loads.

fuel, efficient consumption of fuel to power, simplicity in transportation of power and speed of operation.

Lower maintenance costs and labor-saving features make electric trucks less costly to own. As a result, they have a life expectancy of 10 to 15 years as a unit with operation. Because maintenance and downtime are decreased, the electric truck is "on the job" more of the time.

Fuel-Free And Highly Maneuverable

Battery electric trucks do not smoke, drip engine oil or have an exhaust to tie up dust. They, and in the light against operator fatigue and worker distraction, since they operate quietly and generate no heat, vibration or excessive fumes. Safety features include reduced fuel use and lower operating costs. These features make them more favorable insurance rates.

Internal power permits design flexibility that allows the construction of trucks that are compact and highly maneuverable. Specialized models can operate in restricted spaces, contributing to plant efficiency through improved space utilization.

These features promote safe, more pleasant working conditions and go a long way toward helping the plant manager conform to OSHA regulations.

The Editors of *PMPO* thank *Lead Industries Association* for their help and also to *Jim Blumstein* for his material used in preparing this story.

Circle 500 Reader Service Card

BATTERY-POWERED TRUCKS PROVIDE ECONOMY, SAFETY

Article published as the result
of editorial contact with
INDUSTRIAL MAINTENANCE & PLANT
OPERATION - LIA given credit for
contributing to article

LEAD ACID BATTERY PROVES ITSELF AT KNITTING MILL

Published in AMERICAN METAL
MARKET (first publication of
news feature devoted to subject)

AMERICAN METAL
MARKET
NEW YORK & L
O. 1132

OCT 17 1972

lead and zinc market

Lead Acid Battery Proves Itself at Knitting Mill

NEW YORK — The old standby — the lead-acid battery — just made its bones for the unglamorous task of lifting a North Carolina knitting mill.

After it was all over, some hard-wired detectors had proved a point to Glen Fagelman, president of Aberdeen Trust, Inc., in Aberdeen.

Strange things began to happen shortly after Fagelman opened the plant. There is some lead in the air, but the detectors told the opposite.

Knitting needles and machinery parts were rusting, with replacement parts and parts replacement required to keep the plant operating. Some employees had lost vision, nausea and eye irritation. Production and sales were decreasing because of equipment breakdown and loss in production time.

Engineers, plant engineers and other company investigators were called upon to act as detectives in the hunt for the strange that no one could seem to locate.

Mystery Probed

Temperature and humidity readings, combined with exhaust fumes from a propane-burned lift truck, were first thought to be causing the corrosion, eye irritation and nausea problems, says they were most evident in the area of the plant where the truck operated.

Corroded needles prevented yarn from traveling through the knitting and effectively slowing down

production. An estimated \$500 was spent to replace rusted needles over a two-month period on half the 14 machines in the plant.

In the meantime, steps were taken to replace the truck's battery, lower the engine and change the fuel tanks. But the corrosion of machinery continued unabated.

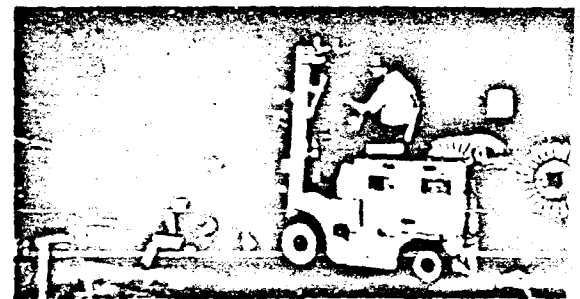
Fagelman thought of buying in the ventilation system was causing human, so he called in representatives of the Carolina Power & Light Co. to investigate.

After giving the plant a thorough going-over, they found that the only deficiencies were coming out of the production area, and attention was focused both to what was first believed to be the source of the problem: the lift truck.

Other Issues

They speculated that fumes emitted from the truck operating in the closed environment of the plant produced an abnormally high concentration of nitrogen in the atmosphere. When the oxygen mix of air was vapor in the air, the combination formed nitric acid, which is highly corrosive to most metals.

The investigators also concluded that the nitric acid mist caused the



LIFT TRUCK — A 4000-lb. capacity lead acid battery-powered lift truck at the Aberdeen, N.C. Knitting plant of Aberdeen Trust, Inc., was substituted for a propane-burned vehicle which was causing production, corrosion and environmental health problems at the plant.

human and eye irritation. They recommended that an electric lift truck replace the propane-burned vehicle.

Wishing to prove their theories and to Aberdeen Trust that their opinion was warranted, the electric company promoted the use of battery-powered electric lift trucks in industrial plants because they are normally recharged during off-peak hours. Carolina Power advised the company in studying the corrosion and environmental problems.

They found that needles placed near where the lift truck operated would rust in three hours, while those at the rear of the building, and some distance from where the truck operated, rusted in 16 hours.

While this tended to confirm the theory about the propane truck, it was felt that the test was inconclusive because of the difference in conditions at the front and rear of the plant.

In addition to nitric acid, it was discovered that propane could contain sulfur which may irritate the

the engine and produce sulfuric acid fumes which promote the high rate of machinery rusting.

With the problem mounting up, Fagelman ordered a lead acid battery-powered lift truck as a replacement for the propane-burned vehicle.

During the 16 months the new truck has been in operation, the plant has experienced no noticeable corrosion action and there have been no further incidents of nausea or eye irritation.

Based on the successful use of the electric truck at the Aberdeen plant, Fagelman ordered another one for a new \$2,000-a-ft. plant that he manages just across the street.

SWITCH OF LIFT TRUCKS FROM
PROPANE TO ELECTRIC REVIVES
TRICOT PLANT
Published in TEXTILE WORLD
(second publication of news
feature devoted to subject)

TextileWorld



requested assistance from the
power company engineers.

But they quickly eliminated
the possible cause.

So Mr. Fugleman decided to
study the propane lift truck op-
eration—and his paydirt. Knowledge
showed a direct relationship
with the problem. Puffs from
the truck in the plant's closed
environment produced a high
concentration of nitrogen. When
this mixed with the atmosphere
water vapor in the plant, and
combined with the heated air,
a chemical reaction took place.
It formed nitric acid mist, high
ly corrosive to most metals.

The study also showed that
employee nausea and eye irrita-
tion were caused by two nitric
acid based poisonous gases—
nitric oxide formed with nitric
acid combined with metal, and
nitrogen dioxide formed when
nitric oxide combined with
oxygen.

Mr. Fugleman decided the pro-
pane-powered truck had to go.
(He could have opted for a cata-
lytic muffler-purifier [Textile
World, Jan. 1970, p. 34]. This
equipment reduces the regular
annual cost of the muffler.) He got a
lead acid battery-powered truck
as a replacement.

Protons All the problems clear-
ed up, and in the 10 months since
the truck went into operation,
not one problem has occurred.

Although lead acid trucks
have a higher initial cost, low
upkeep and operational costs
can level them out. With the rapid
ly increasing impact of environ-
mental concern, unwanted
fumes and trouble.

Switch of lift trucks from propane to electric revives tricot plant

You're running a small to
medium knitting plant that's broad-
based. You've got the latest in pro-
duction equipment, a controlled
environment (70 to 80 F., 50 to 60
and electric heat. You're using a
propane-fueled internal combustion
engine truck for handling
roll bales up to 1,200 pounds.
Everything's beautiful. Suddenly
something happens.

Your knitting needles, ma-
chines parts, and other plant
equipment start rusting. In fact,
it gets so bad that you lay out
an estimated \$5,000 for knitting
needles alone in a two-month
period. Knitting needles even
corrode during machine down-
time for pattern change, and
door latches rust. Maintenance
and supply parts create tears.

Plant employees begin suffer-
ing nausea and eye irritation.
Employee health and morale
become vital concerns.

Produce, obviously, goes
down with loss of machines and
total output, as machines are
stopped frequently for needle
replacement. The damage is
smooth sales and shipment flow.
This is not fiction. It's exactly

what happened to Gloria Fugle-
man, who had received 20 years
of savings and knitting experience
in her first knitting plant in
Aberdeen, N.C. The startup in
October 1969, went off with no
hitches, and things were look-
ing great until these problems
cropped up a short time later.

After eliminating several pos-
sible causes, Mr. Fugleman zeroed
ed in on what he thought was
the culprit—a problem with the
plant electrical heating system,
since the conditions was much
worse in colder weather. He be-

Electric trucks have high initial cost—but no pollutants

Truck type	Gas engine powered			Electric powered		
	Initial cost	Operating cost	Range miles	Initial cost	Operating cost	Range miles
2,000	\$4,200	\$4,000	\$4,000	\$4,000	\$3,500	\$6,750
3,000	5,100	7,300	5,000	5,300	5,000	6,100
4,000	6,700	7,700	7,300	6,000	10,100	9,350
5,000	7,100	7,900	7,700	6,000	11,000	10,100
6,000	8,100	8,300	8,000	10,400	11,000	10,000

SOUND CONTROL MATERIALS LET

THE SOUND OF SILENCE BE HEARD

.....special feature article

published in PRODUCT ENGINEERING

as the result of editorial contact.

(page 1 of 2 pages)

Design engineering feature

Sound control materials let the sound of silence be heard

Lead, plastic foams, glass fibers, mineral wool used separately or in combination can quiet machinery to acceptable consumer levels.

Many control materials either absorb sound, provide a barrier to prevent its transmission, or damp vibration. This is an oversimplified view of a highly complex subject, since often these functions are combined in one material or materials are combined to serve all three functions.

Though there is a lot more to solving today's noise problems than simply surrounding an offending noise producer with one of these materials, some impressive results have been obtained. From small mufflers against the pump hydrofoiled ships, from dental equipment to motors (compressors, sound control materials can handle all these noise, rattling, thumping, and hums.

For most problems facing the design engineer, some kind of material that absorbs sound waves will have to be included. Usually they are lightweight, cellular or fibrous. They do not com-

pletely block the passage of sound, but do hinder its flow. In breaking up the sound waves, the energy is converted into heat.

Sound absorbing materials also reduce sound reflections and consequent reverberations within a confined space.

Foams and fiber materials can cut as much as 10 dB from the reverberating sound levels, when properly applied.

The most commonly used of these absorbers are glass and mineral wools. Many forms are available including batts, blankets and boards. And when compressed with binders, they can be made into rigid slabs.

They can also be compounded with special additives and sprayed on to surfaces or into cavities.

Plastic foams have the disadvantage of having fragile surfaces and tend to "dead." On the other hand, they are low in cost, fire resistant, and versatile.

Another form of sound absorbing material is open- or semi-open-celled plastic foam. The best of these are the polyurethane foams, which can be made flame retardant by adding special ingredients to the basic polymer. Available in sheet

form, sound absorbing foams can be easily die cut for placement into almost any shape or size enclosure.

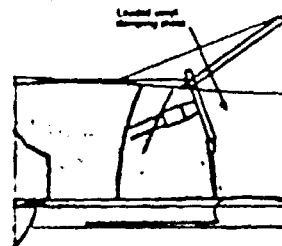
Foamed plastics and urethanes, much more expensive than plastic foams, are also applied to some control problems. They are useful especially in high temperature applications, such as in turbine engines and in laboratory equipment.

Lead is best. Among sound barrier materials, there is less to choose from. Lead is the best and the most widely used. Lead is malleable, heavy, and impermeable to air. Thus, it closely approaches the ideal sound barrier. Moreover, lead sheet is easily worked with simple tools and can be crimped, folded, and molded to provide an air-tight sound-tight seal around equipment and sheet shapes.

The Lead Industries Association and the International Lead Zinc Research Organization (ILZRO) have conducted long-term research and development programs to exploit lead's full potential as a sound barrier. Besides developing new forms and accumulating extensive statistical data, these groups have also explored new applications.



Absorption characteristics of various sound control materials are checked by Soundproof technicians. Different thicknesses are checked in impedance tube.



Passenger compartment of experimental car (ILZRO's Z-78) is shielded from

Product Engineering, October, 1972

SOUND CONTROL MATERIALS LET THE SOUND OF SILENCE BE HEARD

(Page 2 of 2 pages)

Design engineering features

An example is a 1968 Buick Wildcat sedan of several years ago. Primarily a showpiece for most applications, the upper parts are incorporated about lead in door panels and on the floor as a means of quieting the passenger compartment.

Sheet lead is available in weights ranging from 10 lb/sq ft (1/4-in. thick) to 2 lb/sq ft (1/16-in. thick). In sheet form it is easily bonded with elastomeric adhesives to brass, wood, and metal.

Lead is also provided, coated with flexible plastic, then laminated to a glass fiber or other back up cloth. The plastic, usually polyvinyl chloride, adds strength and durability.

Loaded plastics are either bonded to some governing surface or used as enclosures themselves in the form of en-

clousures. The plastic sheet are available in weights ranging from 1/4 to 3 lb/sq ft, and their lighter weight makes them less efficient than sheet lead, and they are very effective when properly employed.

One of the most efficient ways to control sound is by enclosing sound absorbing foam with sound barriers. One company specializing in these materials is Soundcoat Co. (Brooklyn, N.Y.).

Typical of these systems is a construction of a thin lead sheet between two layers of polyurethane foam. The laminated composite is attached to the inner wall of machinery enclosures. An adhesive with a rubber, asphalt, or epoxy base bonds the system to almost any wall surface.

Seems the "best," according to Soundcoat's president, Joseph Man-

Another effective combination of materials was applied to the power unit on a gas turbine driven hydraulic ship, the Deacon. Because weight was at a premium, a light-weight loaded plastic was installed on the engine side of a sound barrier. The sound barrier consisted of two perforated aluminum sheet with a glass fiber in between the sheets for absorbing high frequency sounds.

Vibration dampers. The other kind of sound-control material makes noise by damping vibration. Materials for this purpose are either sheet or paste, and are based on epoxy, latex, or asphaltic compounds.

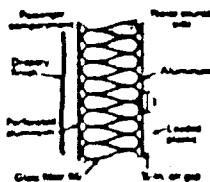
The asphaltic materials are the cheapest and are widely used in undercoats and other areas where vibration induced noise is a problem. Viscous latex materials serve the same purpose, but are used more in stationary applications, because they are easily repaired or removed even with additional work when necessary. The epoxy materials, usually travelable mixtures and fairly expensive, are for severe environments or high humidity.

All of the vibration damping materials provide increased frictional resistance to the vibration of structures coated with mechanical, vibration, or shock. Thus, they are designed to reduce vibration amplification at structural resonances.

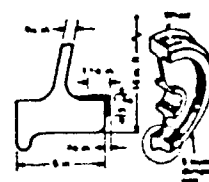
One of the most impressive uses suggested recently for vibration damping materials is on railroad wheels. To prevent the characteristic high screaming sound, a 5-in. thick forged wheel was treated with a circular segment of a special synthetic elastomer compound approximately to the thickness of the wheel section. The treatment reduced noise during sharp turns by 25 db.

Mineralized plastics. Besides materials designed specifically for controlling noise, there are many other ways that materials can inhibit unwanted noise. Plastics are especially effective in mechanical operations in stifling environments. Plastic gears, for example, installed in business equipment and computers effectively cut down on the rattling and whirring that would otherwise occur with metal gears. Larger plastic gears are now being applied to heavy machinery, too. An outstanding example is in a paper mill reeling machine where nylon gears have cut noise by 30 db.

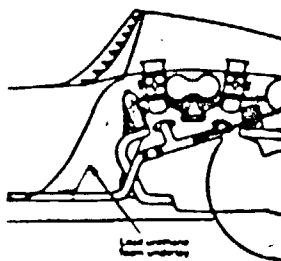
Plastics when replacing metal surfaces in an automatic screw machine have shown similar advantages. The plastics have cut noise from 5 db to 14 db, in a test demonstration.



Damping layer muffles sound of subway wheel. Material is DYAD elastomer.



Turbine hydraulic ship is quieted with several loaded vinyl and thermoplastic.



noise by loaded-vinyl door insert and lead-urethane floor underlay.

Product Engineering, October, 1969

Mining Journal—November 24, 1972

AMERICAN METAL
MARKET
NOV 17 1972
8 11 50MINING
Week

NOV 17 1972

lead and zinc market

Lead Again Boosted as Major Noise Control Material

NEW YORK — Use of lead for sound attenuation — heretofore thought to be a major growth possibility for the metal but disappointing up until now — is getting a big boost as a result of Occupational Safety & Health Administration (OSHA) noise control requirements, according to the Lead Industry Association here.

Lead is playing an increasingly important role in the battle against noise for materials being selected to solve various commercial and industrial noise control problems in the U.S. and Canada, LIA said.

For years lead has been regarded as the most effective and most economical sound barrier material

for muffling severe noise pollution. That's why its slower-than-expected growth in sound attenuation applications has been so puzzling to industry researchers and marketing people.

Lead is being used to muffle in-plant machinery and equipment to

comply with OSHA requirements," LIA said. "It is also being used to bring across sources into compliance with both municipal and OSHA imposed industrial noise regulations."

Most lead sound barrier applications involve either area

sound control products or specially designed sound control systems that are being installed in original equipment.

One lead-enriched system developed to meet OSHA guidelines for in-plant industrial noise control belongs to Maher Engineering, Des Plaines, Ill.

Maher developed a composite lead-encrusted foam-aluminum machinery enclosure panel system that includes the use of two sheet

lead units, each weighing only a half pound per square-foot, to achieve machinery noise reductions of between 20 and 30 decibels, depending on how carefully the enclosure is installed and the original noise levels of the machinery involved.

Orders Mount
That Maher system has already been ordered by several leaded companies, despite the fact it has only recently become available, LIA explained.

A revised design for a composite material machinery enclosure was developed by General Home Construction, Little Falls, N.J. General Home constructed an "ghost-type" enclosure that also complies with OSHA in-plant noise control regulations.

The ghost structure has already been used to enclose two 300-hp freight cars, proving that cost of over 10¢ per square foot doesn't deter General Home's development from being commercially installed at Graham Electric Co., Worcester, Mass., and with very encouraging results, it is reported.

Meanwhile, LIA reported that a noise panel system that can be lead-free — one developed in the U.S. and in Canada — are being used to decrease exterior noise levels of industrial plants, though such can be used to solve in-plant noise problems.

Building Panel
Pro-Eng Buildings, Ltd., Montreal, Que., has developed a uniquely building panel containing two pounds per square-foot of sheet lead.

The panels have already been used for roofing and siding to help two Canadian natural gas company turbine-powered cogeneration stations.

Having received a Sound Transmission Class (STC) rating of 41 in accordance with ASTM specs, the panels decrease the turbine noise to an acceptable level at the property line of each of the two plants, LIA said.

In the U.S., Long Island Lighting Co. is reported to have solved its in-plant noise control problems at its Northport, N.Y., plant, which is located in a quiet residential area.

The utility ordered extremely noisy equipment and its associated ductwork is a new thermal structural composite material panel system produced by the Universal Fabricated Products Division of Trane, Inc., Chicago.

The Trane system incorporates single and double layers of one-pound per square-foot sheet lead to provide varying degrees of sound control.

LEAD

Role Against Noise

THERE IS NO DOUBT that lead has taken hard knocks due to claims in the U.S. and elsewhere to progressively reduce and perhaps eventually eliminate the use of lead in paint. While these concerns with the production and marketing of lead have been lighting lead hard on this front, they have also been pressing to expand the use of lead in other directions.

There will certainly come some acknowledgment in the latter regard from a recent development in the U.S. that could stimulate its use for noise attenuation. According to the Lead Industry Association of the U.S., this project arises from noise control requirements laid down by the Occupational Safety and Health Administration.

The American Metal Market reports the LIA as concluding that "lead is playing an increasingly important role in the lead industry for materials being selected to solve various commercial and industrial noise control problems in the U.S. and Canada."

In terms of specific applications for lead as a sound control, the LIA highlights the development by Maher Engineering of composite lead-foam-aluminum enclosures to reduce machinery noise by absorbing sound. Further, panel systems incorporating lead to decrease exterior noise levels of industrial plants are being developed in Canada and the U.S. One composite building panel system is now being used in using 2 lb/sq ft of lead sheet. These have been used to shield the roof and walls of two turbine-driven cogeneration stations owned by a Canadian natural gas company.

Therefore, a U.S. power utility is said to have ordered a major exterior plant noise problem at Northport, N.Y., through use of a thermal-structural panel system produced by Trane, Inc. of Chicago.

Special article prepared on the
use of lead in noise control
applications
....published in AMERICAN METAL
MARKET and reprinted in MINING
JOURNAL

Iron Age

A Chilton Publication/November 9, 1972

Soundproof enclosures

Made of aluminum and sound-deadening materials, these enclosures are for plant production equipment. Custom-built, they meet most OSHA standards.



They can be tailored to fit any machinery configuration. Also, integral panels, sound-deadening materials and frame extrusions are available if the customer prefers to build his own unit. (Play-

right: Mather supplies the... (left: Mather Engineer Co., Des Moines, designed the enclosures.) Reductions of 26 to 50 decibels can be achieved with this unit.

SHEET LEAD FEATURED IN NEWLY DEVELOPED MACHINERY NOISE ENCLOSURE
....published in IRON AGE,
INDUSTRIAL EQUIPMENT NEWS,
MACHINE DESIGN and as a special feature in DESIGN NEWS

6134 INDUSTRIAL EQUIPMENT NEWS
NOV. 12, 1972

DEC 1972 (COPYRIGHTED)

966 MACHINE ENCLOSURES

reduce sound, meet OSHA standards



Enclosures of aluminum and sound-deadening materials help meet environmental noise level requirements for manufacturing facilities. Company builds custom enclosures to satisfy OSHA standards and

fit any size machinery. In addition, individual panels, sound-deadening materials and frame extrusions are available so a customer can build his own unit. Enclosures and modular panels are constructed of aluminum and covered with lead sheet and sound-deadening materials. Reductions of 25 to 50 dB are possible. 150 20000000 materials give light weight, corrosion resistance, and high noise reduction. Completed panels are about 1 1/2 in. thick and panels for 20-40 year old machinery are 2 by 4, 4 by 4, and 4 by 6 ft.

MACHINE DESIGN

A PENTON PUBLICATION

NOVEMBER 14, 1972

New Products

Lead/Foam Composite Stops Noise

Sound-level reductions of 26 to 50 dB are claimed for acoustic enclosures developed by Mather Engineering, Des Moines, HI. Secret 10 is the sound-deadening panels used in the enclosures. Each panel has an aluminum outer sheet, from 0.040 to 0.062 in. thick, that is lined with a 1.5-in. thick layer of lead-bearing urethane foam. Sandwiched in the foam are two sheets of lead tape, each 0.0078 in. thick and weighing 0.5 lb/sq ft. The aluminum-framed panels are built in 2 x 4, 3 x 6, and 4 x 6-ft standard sizes and in various custom-built sizes and shapes.



Design News

ENVIRONMENT 1

Methods of Noise Control

Protection should be either of administrative or engineering type. If these fail to reduce sound levels to permissible limits, personal protective equipment must be provided. Engineering methods for noise control:

- using rubber or plastic bumpers or cushions to damp vibration
- increasing mass and stiffness to damp vibration
- using flexible mountings, couplers in pipe runs, shaft couplings, flange sections in ducts and nozzles flanging to reduce sound transmission through joints
- using intake and exhaust mufflers
- designing fan blades to reduce turbulence
- completely enclosing individual machines
- using baffles
- substituting larger slower machines for smaller faster ones, shop dust for single operation dies, process for tumblers, rotating shafts for square shafts, hydraulic for mechanical presses, and belt drives for gears
- substituting compression for impact mixing, grinding for mixing, hot for cold working and pressing for rolling or forging
- using large size speed fans for smaller, high speed fans
- enclosing high noise machines in insulated rooms
- providing relatively sound-proof booths for operators or attendants of any of these machines



Sound insulated enclosures can assist need to redesign existing equipment. Panels of sheet lead sandwiched in aluminum or polyurethane foam, with outer exterior facing, can achieve reductions of between 25 to 30 dB, depending on construction and original noise levels. Enclosures are available in standard sizes and can be custom-built. Sheet materials, including lead vinyl and sheet lead, can be combined with various adhesives and attachment schemes. (Lead Industries Assn., Inc. and Harker Engineering Co.)

SHEET LEAD FEATURED IN NEWLY DEVELOPED MACHINE NOISE ENCLOSURE PANEL SYSTEM

.....published as part of special

Environmental One issue of DESIGN NEWS

Special full lead, built-to-order testing of the high speed drive units at 24,000 to 10,000 rpm measures generated noise and vibration. Unit is matched on gas turbine driven at 5,100 rpm to drive compressor at 10,000 rpm. Noise is tested to qualify units at less than 90 dB with octave band noise of less than 85 dB. All measurements are taken with computer graphic level recorder and microphone. (Photographic Gear Corp.)

The cooperation of the following organizations is greatly appreciated:

ASSN. OF NOISE-RELATED MANUFACTURERS

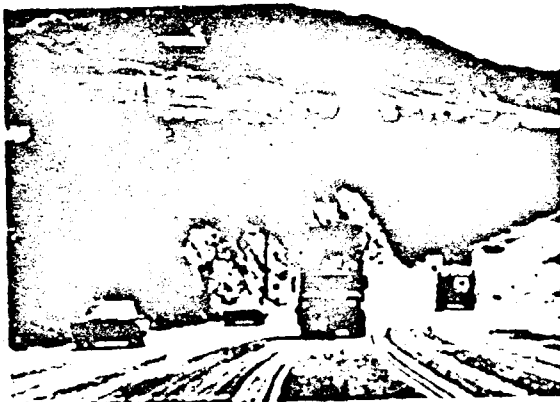
AVCO CORP.
Bosch Div.
Dodge Div.
Ford Div.
General Motors Div.
Hercules Div.
Ingersoll Rand Div.
International Harvester Corp.
Lead Industries Assn.
Rockwell Products Div.

Rockwell, Inc.
Div. of Rockwell-International
Foster Controls Div.
General Motors Div.
Hercules Div.
Ingersoll Rand Div.
International Harvester Corp.
Lead Industries Assn.
Rockwell Products Div.
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AMERICAN
METAL MARKET
BY F. B. B. & S. S.
RELEASE 14.86

NOV 29 1972

EIGHT
PAGES

PAVEMENT MARKINGS separate opposing directions of traffic flow and are often used to denote road edges. If the 1973 National Highway Safety Act is passed, about \$40 million will be allocated to provide the materials, paint and equipment to mark approximately 800,000 miles of roadway. Paint to be used will be chrome yellow, which contains about four pounds of lead per gallon. If it takes 14.4 gallons of paint for one mile of average four-lane road striping,...

Key Highway Marking Programs to Use Chrome Yellow Paint Containing Lead

NEW YORK — Lead-containing chrome yellow paint is expected to play a major role in two highway pavement marking programs that are key elements of a proposed nationwide Federally-funded highway safety program.

Over the course of a number of years, perhaps as much as one million tons of lead could be used in the programs.

The nationwide highway safety program would result from passage of the Highway Safety Act of 1973, which is expected to be passed early in the next session of Congress.

The two highway pavement marking programs, which will cost a combined \$200 million — are considered of priority nature from among the more than a dozen highway safety programs that would be authorized by the Act.

Lead Industries Association here, with a vested interest in what the Act could mean to the domestic lead market, says the two highway programs were developed to help decrease "the staggering 16.4 million vehicular traffic fatalities that resulted in 55,000 deaths, 2 million disabling injuries and more than \$15 billion in property damage" in the U.S. during each of the past two years.

Other programs of the Act.

Other programs of the Act that are expected to be authorized could cost in the neighborhood of \$1.5 billion in the years ahead, it is reported.

In terms of lead usage itself, LIA said it takes about 14.4 gallons of chrome yellow paint to paint one mile of average four-lane road striping, and there are about four pounds of lead per gallon of chrome yellow.

The first project that would be authorized by the Act is a special pavement marking program that will utilize "highway yellow," or lead chrome, a special color standard that has been specified for all customary highway traffic control devices, including signs.

Chrome yellow (lead chromate) is the yellow paint pigment that most readily meets the flat standard color requirement, said LIA. Yellow is known to be the most visible color to the human eye from among all those in the visible color spectrum.

But in addition, chrome yellow pigment possesses other important qualities for highway marking applications.

According to LIA, these include a long resistance to degradation by light, and

a resistance to chemicals used to remove snow and ice from pavements.

In carrying out the overall program, LIA says it is estimated that 800,000 miles of two-lane road will receive yellow centerline markings, and the approximate cost will be \$40 million. Additional funds will be committed for more yellow pavement markings on rural and heavily used roads.

Markings of chrome yellow could approach 1,200,000 under the two-

PROPOSED NATIONWIDE HIGHWAY SAFETY
PROGRAM TO INCREASE USE OF CHROME
YELLOW PAINT

.....published in AMERICAN METAL
MARKET (first publication of this
feature article)

STAINED GLASS -- THE ART FORM THAT
GOES ON -- FROM LEAD INDUSTRIES
.....Feature article published in
NATIONAL GLASS BUDGET as the result
of editorial request

13-12 NATIONAL GLASS BUDGET
TUESDAY, 1972

OCT 7 1972

Stained Glass -- The Art Form That Goes On -- From Lead Industries

If anyone has any doubts about the present vitality of the stained glass market, he may be surprised to learn that the manufacture of stained glass is estimated to exceed \$25 million annually. So an old art form that began as an architectural adjunct in the Middle Ages, all its own with its perfection by the designers of religious institutions, is still very much with us.

By now, of course, stained glass has broadened its scope. Private homes, commercial buildings, retail stores, schools, and subsequently was elevated to a place and a wide variety of other establishments can be found

with stained glass today. It's important to add that the glass is being used as a significant decorative item and not just as a window or door.

Lead, of course, is synonymous with stained glass. Besides being the carrier for the glass itself and the shape of the design in question, the lead is used in various thicknesses and proportions to the glass to give added definition, shape, and depth to the design.

The actual process of putting together a stained glass window has varied little since the 13th century when the windows of the great European cathedrals were made. A tile was black and white "cartoon" of the design is made. The cartoon is cut in pieces, each one representing a different piece of stained glass. The glass itself is cut using the cartoon as a pattern and a glazier puts the window together.

The glass is put in place and bound with plastic leading called cames. Finally each leading joint is soldered for strength. The lead cames are normally H-shaped to accommodate the insertion of the glass. The lead's pliability is a key factor in its use for stained glass—as well as its solderability and the beautiful patina it acquires with time.

A spectacular new technique, developed at a relatively recent date, involves soldering sculptured 3-D sheet lead overlays to the basic lead cames which ordinarily hold the stained glass in place. These overlays, formed in relief, are incised with carefully formed and located dies of varying widths which allow the light to shine through the richly colored glass during the day. The "halation" of light through first the glass and then through these dies allows some of the beauty of the glass to be lost. At the same time the sculptured lead, covered with gold leaf, fulfills the representational function of the window in silhouette. It is at night, therefore, when the glass is normally dark that the interior light reflects the golden design with startling intensity. Thus the window functions as well by night as by day.

INDUSTRIAL ENGINEERING
CLEVELAND, OHIO
MONTHLY NEWS

AUG 1972 **LEADS BY**

SEE A new 14-page brochure describes the performance and benefits of electric, battery-powered, in-plant trucks. Includes a cost comparison calculator. Lead Industries Association, Inc.

ELI FOOD PROCESSING
ELI, OHIO

AUG 1972 **LEADS BY**

Lead Industry Institute promotes electric trucks

The Lead Industry Institute has published a new 14-page brochure, "14-page brochure outlining what it does are the benefits of operating lead acid battery-powered in-plant electric trucks."

The brochure includes performance reports from users of battery units across Canada as well as those from internal combustion powered trucks. It discusses operation and maintenance costs, environmental considerations, safety and efficiency. A series of photographs are included to illustrate potential users to figure the costs of owning, operating, and maintaining in-plant trucks.

Market Development, Chemicals Inc., 1900 West George St., Vancouver, B.C. V6G 1A1. Tel. 604-466-6311.

9-18 BATTERY INDUSTRIES
S.A. NEWS

SEP 8 1972 **LEADS BY**

PORE LIFTS A 14-page brochure illustrates a line of battery powered industrial electric trucks with actual performance reports from coast-to-coast users of both internal combustion powered and electric trucks. Topics include operation and maintenance costs, environmental advantages, safety, and efficiency. Lead Industries Association, Inc. Circle 117 on Reader Service Card.

ELI FOOD PROCESSING
ELI, OHIO

OCT 1972 **LEADS BY**

1. Economics of operating lead acid battery-powered electric trucks is discussed in booklet from Lead Industries Assn., Inc. Topics such as operation and maintenance costs, environmental advantages, safety and efficiency are discussed. Booklet L-14 will be sent. 500

Examples of publication of
Lead Industries Association, Inc.

literature availability announcements -

"Why You Should Specify Electric
Battery Powered Lift Vehicles"

....published in 11 magazines

4-18 BATTERY NEWS
ELI, OHIO

SEP 1972 **LEADS BY**

IN-PLANT INVESTIGATION

The Lead Industries Association, Inc. has just released a two-page report of an article dealing with the establishment of limits of carbon monoxide concentrations for in-plant atmospheres by various public health agencies. The article covers the results of CO in-plant investigations made by the state health department of Michigan, New Jersey, Hawaii and others.

Permissible in-plant CO levels for enclosed areas are discussed and cost estimates are given for ventilation systems required to maintain permissible levels when using either gasoline or propane powered, internal combustion industrial trucks. Extra ventilating equipment is not required when using lead acid battery-powered trucks in in-plant service.

Copies of the report, "In-plant electric get new role edge" may be obtained by writing to Lead Industries Association, Inc., 292 Madison Avenue, New York, N.Y. 10017.

INDUSTRIAL ENGINEERING
CLEVELAND, OHIO
MONTHLY NEWS

SEP 1972 **LEADS BY**

Economics of Electric Trucks Described

The Lead Industries Association, Inc. has just published a new two-color, 16-page booklet on the benefits and economics of operating lead acid battery-powered industrial electric trucks. Entitled "Let Profits Electrically," the booklet contains actual performance reports from coast-to-coast users of both internal combustion powered and electric trucks.

The new booklet discusses such topics as operation and maintenance costs, environmental advantages, safety and efficiency. Also included in the booklet are a series of photographs that enable potential users to figure the cost of owning, operating, and maintaining in-plant trucks, as well as providing a direct comparison of these factors between IC engine-powered and electric trucks.

For more information, call Reader 17

ELI FOOD PROCESSING
ELI, OHIO

OCT 1972 **LEADS BY**

4. "Let Profits Electrically" is a Lead Industries Association booklet on the economics of operating lead acid battery-powered industrial electric trucks. It contains actual performance reports from users of both lead acid and combustion-powered and electric trucks. For your copy write 177 on postcard.

9-18 BATTERY INDUSTRIES
S.A. NEWS

JUL 24 1972 **LEADS BY**

Performance data shows "why you should specify electric battery powered lift vehicles" in this booklet from Lead Industries Assn.

INDUSTRIAL ENGINEERING
CLEVELAND, OHIO
MONTHLY NEWS

OCT 1972 **LEADS BY**

CARBON MONOXIDE LEVELS INVESTIGATED
Report gives the permissible highest CO levels determined by several state health departments. Includes cost estimates for ventilation systems required to maintain permissible levels when using either gasoline or propane powered, internal combustion industrial trucks. Lead Industries Association. Circle 121 on Reader Service Card.

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15 THE CHEMICAL
MARKETING REPORTER
WILL. 16.00

JUL 24 1972

EXPERT
BACON

Metals & Minerals

Lead—Lead Industries Association, Inc., in its annual review of the lead industry estimates 1971 consumption in most major market categories was about the same or slightly less than in 1970—1970 a few notable exceptions.

A sharp increase in consumption for automotive is due to the result of replacement of lead batteries for sporting automobiles. Other increases in the market, caused with recovery over further production, is believed to have prompted these increases in other categories.

Lead southeast address, along with points and consumption, have led the process of the automotive, production, LIA says that with this market, as with automotive, the apparent has seemed to have been the largest to consume battery demand, rather than to a definite drop in use.

Consumption of lead in end-use markets in 1971, together with comparative figures for 1970, are reported by the association in short lead as follows:

	1971	1970
Automotive	1,000,000	950,000
Battery	1,000,000	950,000
Chemical	1,000,000	950,000
Construction	1,000,000	950,000
Electricity	1,000,000	950,000
Food	1,000,000	950,000
General	1,000,000	950,000
Industrial	1,000,000	950,000
Medical	1,000,000	950,000
Paints	1,000,000	950,000
Pig	1,000,000	950,000
Plastics	1,000,000	950,000
Refrigeration	1,000,000	950,000
Roofing	1,000,000	950,000
Secondary	1,000,000	950,000
Storage	1,000,000	950,000
Telephone	1,000,000	950,000
Transportation	1,000,000	950,000
Welding	1,000,000	950,000
Wire	1,000,000	950,000
Other	1,000,000	950,000
Total	1,000,000	950,000

AMERICAN MINERAL
BUREAU
NEW YORK, N.Y.
10017

JUL 28 1972

US Lead in '71 Reviewed

NEW YORK — Lead Industries Association, Inc., has just published and released for distribution its 1971 Annual Review of the U.S. Lead Industry.

The 22-page report, available free from the association, provides in-depth data on the production and consumption of lead in the U.S.

Charts and graphs provide a breakdown for lead consumption by products from 1967 through 1971. Also discussed are details concerning various markets for lead, a report on the secondary production of lead, a short-range outlook for lead consumption, and research projects being developed by the International Lead Zinc Research Organization (ILZRO).

Also covered in the 1971 Annual Review are consumption and production of lead in the United Kingdom, India, Japan, Australia

Examples of publication of

Lead Industries Association, Inc.

literature availability announcements:

"Free World Supply and Demand For Lead

And Zinc Through 1975"

....published in 14 magazines

BATTERY NEWS
LINDS, FLA.
MONTHLY NEWS

OCT 1972

WHO
WHAT
WHERE

NEW YORK, N.Y.
10017

The Lead Industries Association, Inc. and the Zinc Institute, Inc., have announced the availability of a 22-page report on the supply and demand of lead and zinc in the Free World for the period 1972-75.

The first section of the report discusses the production and consumption of lead in the U.S. and summarizes similar data for the Free World.

U.S. and world consumption and production of zinc are discussed in the second section of the report. Both sections are illustrated with charts and graphs showing U.S. and world markets and production forecasts for the next three years.

Also announced by LIA is the publication of the 1971 Annual Review of the U.S. Lead Industry. This 22-page report provides in-depth data on lead production and consumption of lead in the U.S. as well as other parts of the world.

Both reports are free and can be obtained from Lead Industries Ass., Inc., 281 Madison Ave., New York, N.Y. 10017.

AMERICAN PAPER
RESEARCH
ST. LOUIS, MO.
63102

AUG 14 1972

Lead Industry Publications Now Available

New York, Aug. 16 — The Lead Industries Association, Inc., has announced the publication of the "1971 Annual Review of the U.S. Lead Industry," a 22-page in-depth report of production and consumption in the U.S. and the United Kingdom, India, Japan, Australia and other developing countries.

Markets, secondary production, and short-range outlooks for lead consumption are included, as well as reports on research projects by the International Lead Zinc Research Organization.

Also available from the association are the first two issues of LEAD magazine.

The magazine includes a report on the history of organization policies and the role of the lead industry in the environment.

The Review and the magazine are available free from the Association, 281 Madison Ave., New York, N.Y. 10017.

4144 SOUTHERN
CALIFORNIA INDUSTRIAL
NEWS
WILL. 16.00

SEP 5 1972

EXPERT
BACON

Zinc Demand '95'

The Lead Industries Association, Inc., and the Zinc Institute, Inc., have announced the availability of a 22-page report on the supply and demand of lead and zinc for the period of 1972-75. Zinc Institute, Inc., 281 Madison Ave., New York, N.Y. 10017.

4144 SOUTHERN
CALIFORNIA INDUSTRIAL
NEWS
WILL. 16.00

AUG 28 1972

EXPERT
BACON

Reports 72-75 Lead, Zinc Supply, Demand

A report on the supply and demand of lead and zinc in the Free World for the years 1972-75 is being made available by the Lead Industries Association, Inc., and the Zinc Institute, Inc.

The first section of the 22-page report discusses the production and consumption of lead in the Free World. Charts and graphs show lead usage.

The second section of the report discusses consumption and production of zinc. In addition to detailed information on specific markets for zinc production, the report is illustrated with charts and graphs showing world supply and production forecasts for the next three years.

A free copy of the report, 1972-1975 Lead and Zinc Free World Supply and Demand, can be obtained by writing: Zinc Institute, Inc., 281 Madison Ave., New York, N.Y. 10017.

4144 SOUTHERN
CALIFORNIA INDUSTRIAL
NEWS
WILL. 16.00

OCT 1972

EXPERT
BACON

LIA MINING NEWS, INC. 455

NEW YORK, N.Y.

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The first section of the report discusses the production and consumption of lead in the U.S. and summarizes similar data for the Free World.

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Both reports are free and can be obtained from Lead Industries Ass., Inc., 281 Madison Ave., New York, N.Y. 10017.

4144 SOUTHERN
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NEWS
WILL. 16.00

NOV 1972

EXPERT
BACON

1972 Supply and demand of lead and zinc. A 22-page report is available on the supply and demand of lead and zinc in the Free World for the period 1972-1975. Charts and graphs are used to illustrate markets and production forecasts. Lead Industries Ass., Inc., New York, N.Y.

1972 Zinc Shortage. A two-page report covering latest and complete zinc shortage, estimates, zinc controllers and zinc price for each year from 1967 to 1971 with price indicators from Telephone Marketing Bureau.

1972 Lead Shortage. A two-page report covering latest and complete lead shortage, estimates, lead controllers and lead price for each year from 1967 to 1971 with price indicators from Telephone Marketing Bureau.

Examples of feature articles

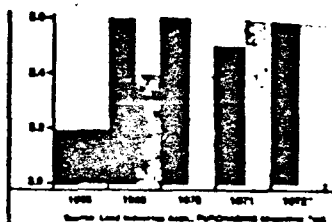
developed by newspaper and magazine
editors receiving copies of"Free World Supply and Demand For Lead
And Zinc Through 1975"PURCHASING
NEW YORK, N. Y.
S. S. 1000 12,000

SEP 19 1972

Lead in balance, zinc barely
adequate, says panel

SUPPLY AND DEMAND for both lead and zinc should be fairly well balanced between now and 1975. This was the forecast that emerged from a panel of the Lead Industries Assoc./Zinc Inst.

Richard D. Mushkin of American Smelting & Refining Co. predicted that lead consumption in the Free World would increase about 2.5% annually between 1971 and 1975. He said zinc use would grow more slowly than in the past four years, when the annual growth rate averaged 2.5%. Mushkin said the



growth pattern would be rather irregular, because lead demand would be subject to increasing economic and environmental pressures. Noting the close ties between auto production and use and the lead industry, Mushkin concluded that proposed elimination of lead from gasoline would mean that by 1975 only 250,000 tons of lead would be used as additive, compared to an estimated 280,000 in 1971. But the 30,000 ton drop would be largely offset by increased demand for lead-lead batteries by 1975. The latter market might expand considerably, to the extent that electrically powered vehicles can replace gasoline engines for some uses.

Lead for structural applications is also a potentially big market, Mushkin said, but other markets are likely to remain stable.

As for supply, Mushkin projected an annual growth rate of about 2% from 1971 to 1975. Although this would mean slower growth for supply than demand, Mushkin believes there is adequate capacity for all metals through 1975. He noted potential significant output increases in Ireland and Yugoslavia, as well as more modest gains in the U.S. and elsewhere.

For zinc users the picture is somewhat less encouraging, according to Keith C. Hendrick of Noranda Sales Corp. He predicted that world demand for zinc would increase about 843,000 tons between 1971 and 1975. This would be a 1.9% increase over all, or about 4.5% a year—compared to 4.75% a year throughout the 1960s.

Mine production of zinc should increase about 800,000-850,000 tons in 1971-75—about 3.4% a year. Considering the surplus existing at present, said Hendrick, this growth should be enough to provide an approximate balance from 1973 on.

The need comes in actual production of zinc metal. He forecast a growth of about half a million tons total, or about 2% a year. And while at the start of 1971 the industry had an estimated 30% surplus of production capacity, this margin will be reduced by smaller closings and increased production. After this year the margin of surplus capacity will be about 100,000 tons, compared to 1.2 million at the start of '71. Allowing for strikes and other possible interruptions, most analysts will probably

SPOKANE, WASH.
SPOKANE DAILY
CHRONICLE
S. 1000

AUG 28 1972

Northwest Mine News

Outlook for Zinc
Called "Bullish"

A "bullish" report on the outlook to provide nearly 10 years of lead is forecast in a new study by the Free World Supply and Demand for Lead and Zinc Through 1975, published by the Lead Industries Association, Inc. and the Zinc Institute, Inc. of New York.

Keith C. Hendrick, executive vice president of Noranda Sales Corp., is quoted as "forecasting a strong future industry which will continue to expand and to maintain its position." He anticipates that the price of lead will be adjusted to the level of the zinc market. The zinc market has been depressed for some time, but the current price level is being maintained.

Little Change Seen
The report forecasts that zinc production will increase at a rate of 1.9% per year through 1975. The current rate of increase is 4.75%.

The report says that zinc consumption will increase at a rate of 1.9% per year through 1975. The current rate of increase is 4.75%.

DENVER, COL.
MINING RECORD
S. 1000

SEP 27 1972

Report On Lead Market
Terms Industry Healthy

NEW YORK—The lead market is healthy, says a report in the industry bulletin. This appears to be the conclusion of a new report on the Free World supply and demand for lead and zinc through 1975, published by the Lead Industries Assn. Inc. and the Zinc Institute, Inc. of New York.

Richard D. Mushkin, executive vice president of American Smelting & Refining Co., is quoted as saying the current supply situation of the two metals.

"I feel that the lead industry is far from the ordinary one which many would have to believe, and although growth may be slow and rather tentative at times, I feel it is a stable and progressive industry which will grow up slowly to the various pressures surrounding it today and, in the long run, will prosper."

Mushkin predicted that consumption of lead in the Free World will grow by 2.5% per year through 1975, while production will increase by 2% per year.

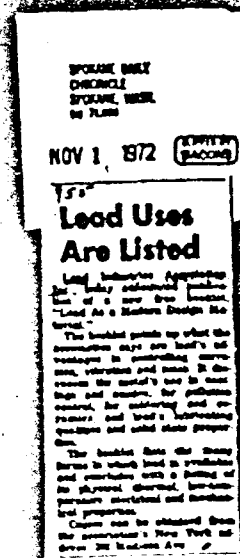
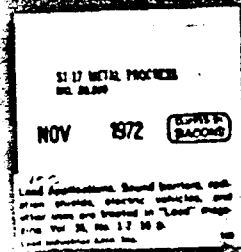
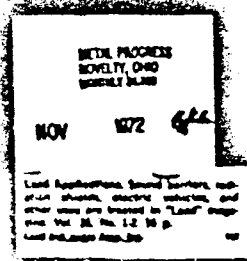
If the Environmental Protection Agency's standards are met, lead usage in gasoline will decline to about 125,000 tons a year by 1975 from last year's 240,000 tons.

On the other hand, lead consumption in lead-acid batteries will increase about 25,000 tons a year, he estimated. In 1970, about 570,000 tons of lead went into automobile batteries.

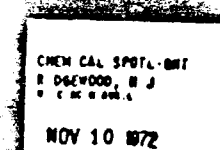
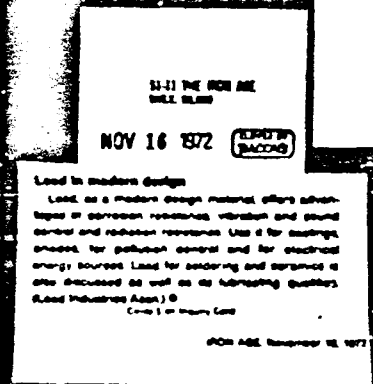
A growing market for lead is in nonferrous metal production, he said. The oil and gas industry is experimenting with the use of lead in the production of lead-acid batteries. One lead-acid battery could contain more than 500 tons of lead just to cover the production.

The development of a potential gas-controlled charging system, it is said, could open new uses for lead-acid batteries by making a completely sealed battery possible and allowing the manufacture of a small, high-current density battery that could operate in any position.

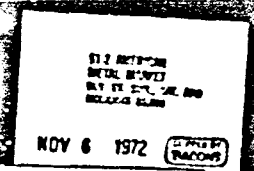
The use of battery-powered home appliances such as lawnmowers and hedge trimmers, he would become particularly important. Research has shown that gas-controlled charging can be accomplished in about one-tenth the time of today's charging method, and, at the same time, battery life can be extended to several times more than today's normal battery life. Mushkin said.



Examples of publication of
Lead Industries Association, Inc.
literature availability announcements....
"Lead...As A Modern Design Material"
....published in 6 magazines



A New 8-page booklet published by Lead Industries Association, replacing 9-year-old brochure, lists useful properties of lead & highlights advantageous use of the heavy metal for corrosion resistance, vibration & sound control, radiation shielding, soldering, electrical uses, & other applications....



The metal's usefulness in corrosion control, vibration and sound control, radiation resistance, coatings and shields, soldering and brazing, and lubricating applications are also discussed along with a listing of the many forms in which lead is available: sheet and rod, wire, mesh, mesh, laminations, bonded sheet, powder, shot, waste alloys, compounds and mixtures.

The booklet concludes with a listing of the physical, chemical, and mechanical properties of lead.