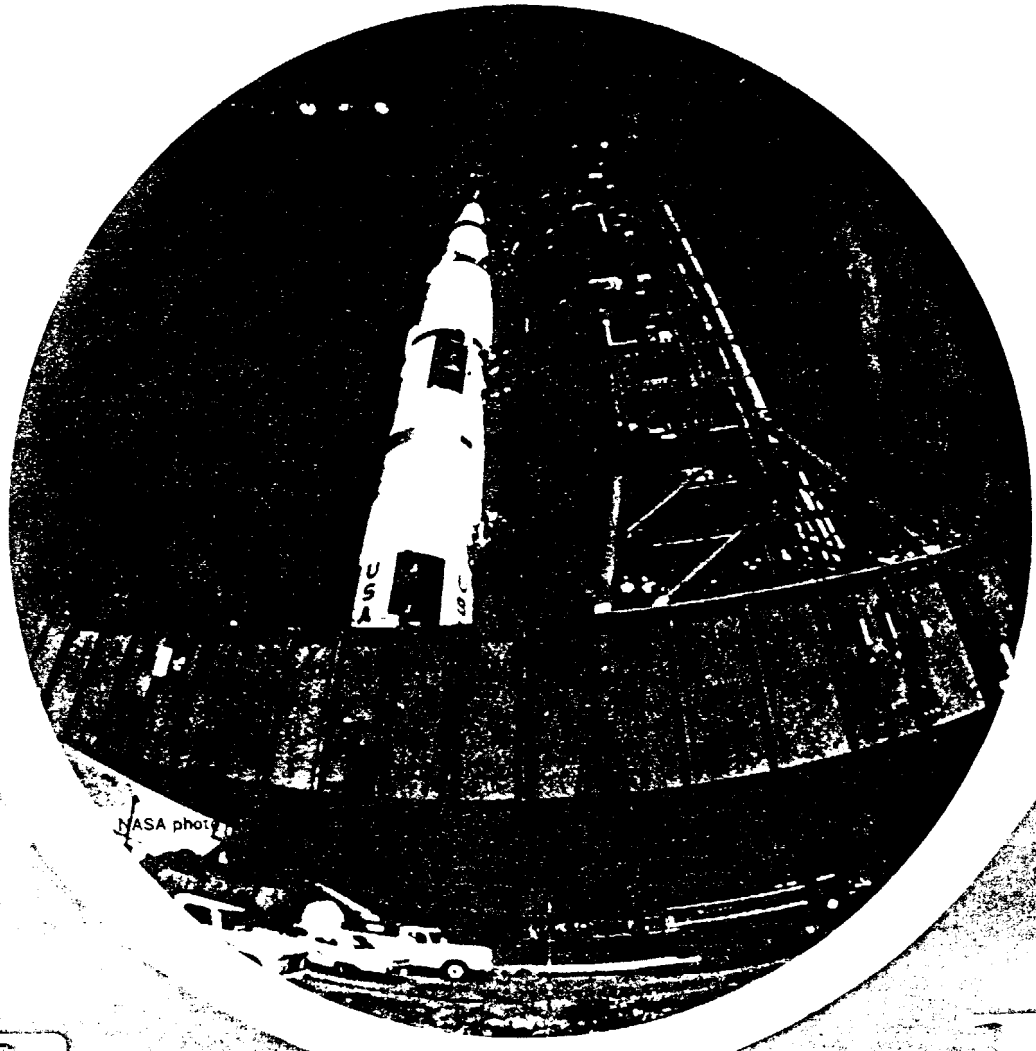


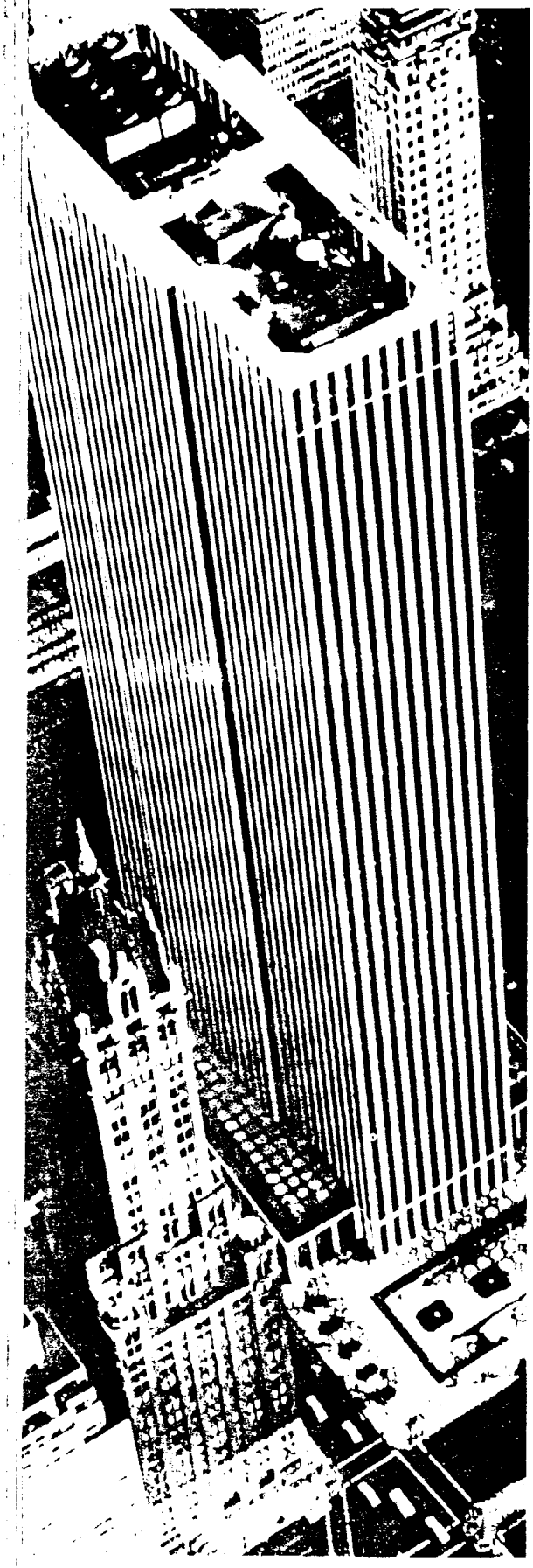
First Step Before
the Giant Leap
— See Page 6.

NASA photo

lead

LEAD INDUSTRIES ASSOCIATION, INC

292 MADISON AVENUE, NEW YORK, N. Y. 10017



SHEET LEAD ASSURES OFFICE PRIVACY FOR J. B. WILLIAMS CO.

When the J. B. Williams Company recently decided to expand its facilities in New York City, it not only moved into larger quarters but into the city's most fashionable area, the General Motors Building on Fifth Avenue and 59th Street. Here, on the 44th and 45th floors, architect Richard Gascoyne provided this internationally known manufacturer of toiletries and pharmaceuticals with well planned offices including the latest facilities for comfortable and efficient use of the space. Among the amenities provided, now expected of designers almost as a matter of course, are insurance of office freedom and freedom from unwanted noise.

In modern office building construction, a major factor in noise transmission is the overhead plenum, the area between the hung ceiling and the floor above. The plenum space which is designed to provide passage for air conditioning ducts and conduits also permits sound, filtering through the porous ceiling tile, to travel over partitions and down through the ceiling on the other side.

At J. B. Williams Company approved plans called for 2¼ in. thick Vaughan wall partitions with a sound transmission rating of 36 db. S.T.C. The overhead plenums were blocked with today's most efficient sound barriers: 1-lb (1/64 in. thick) sheet lead. The sheet lead, hung from the slab above to the top of the ceiling construction over the partitions, in combination with the ceiling tiles, insured an overall 36 db. matching the rating of the partitions themselves. In addition the ease of installing lead sheet, even around pipes, ducts and conduits, saved time, effort, and labor on the job.

The plenum barriers in the offices, installed by Moveable Partitions Co. of New York City, utilized over 10,000 sq. ft. of sheet lead. To install the sheet, wood blocking was first attached to the slab and calked to seal against any possible leak. Sheet lead was then cut to length, folded over thin batten strips and stapled into place. This made it possible to lift the sheet and nail it to the wood blocks. The lead was allowed to extend beyond the ends of the batten strips so that it could be folded over to form a sound-tight joint between adjoining sheets. After these joints were made they were sealed with tape. Sufficient lead was left on the length of each sheet so that it could be formed into a drape seal over the top of the partitions. The transmission loss for the plenums was equal to that of the Vaughan wall construction. This resulted in keeping noise from infiltrating from one office to another and assured a quiet working environment without sound pollution.

LIA26557

Lead Infiltrated Iron Offers Slick New Design Possibilities

Lead infiltrated iron materials provide lubrication for the pantograph slider bars on the high speed Tokaido Super Express.

Anyone who's ever skinned his knee on a smooth surface knows the rapid-and sometimes painful-heat buildup that friction causes. Well picture then. the problems faced by the Japanese National Railways when it came to choosing a slider bar material for the pantographs on its 130 mile-per-hour Tokaido Super Express.

Tests run in 1962 showed that conventional slider material would not last long enough even to get the train from Tokyo to Osaka once, a distance of about 320 miles! To solve the problem. the Railway invited several firms to explore materials and develop a metallurgical answer.

Many approaches were investigated, and one of these more than overcame the problem. Developed by the Mitsubishi Metal Mining Company. Ltd., it is a new material, called Bishiralloy. Basically. it is a lead infiltrated iron alloy loaded with anywhere from 15% to 30% lead.

A family of three of these lead infiltrated alloys is now available: Bishiralloy "A", the first of the family to be developed, Bishiralloy "B", used where higher strength is required, and Bishiralloy "C" designed for the highest wear.

The new alloys are in use on the Tokaido Super Express, and they have certainly proved their value as a friction material. In operation, the lead initially provides a lubricating film at the surface of the slider bar. As the friction surface of the slider bar becomes hot due to lack of lubrication, lead in the surface pores of the alloy melts and absorbs heat as latent heat of fusion. If there is still inadequate lubrication, the iron alloy heats further producing additional molten lead. When it melts, expansion pushes a little lead out of the pores for controlled lubricity. With sufficient lead at the surface, full lubricity is restored and the temperature then decreases until further lead is needed. Thus the lead infiltrated alloy provides a self-regulating supply of lubrication from its internal pores to obtain its excellent wear resistant qualities. Tests under actual operating conditions have proved the new slider bars (Bishiralloy C) have a service life of over 10.000 miles.

Machinability of the new alloys is approximately the same as free machining steel. The lead in the alloy is inherently self lubricating and reduces friction at the tool-chip interface.

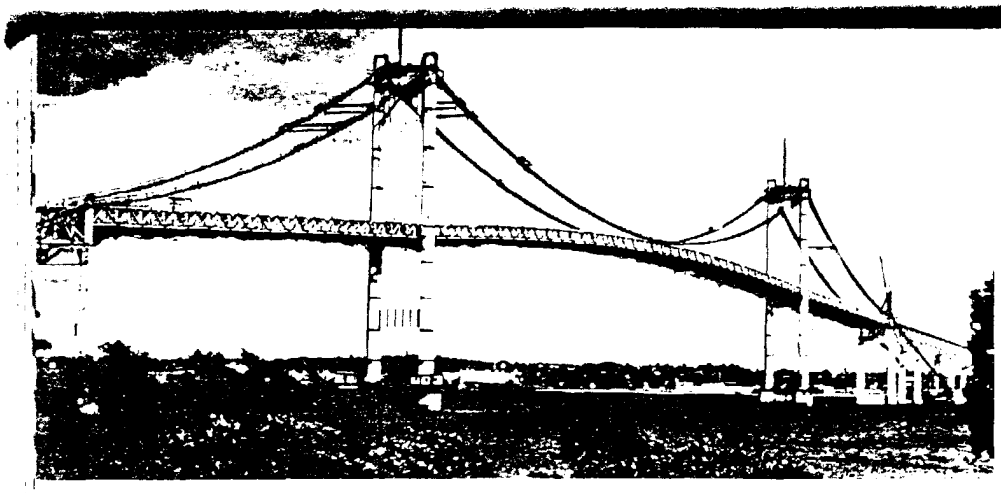
This makes possible up to a 40% increase in cutting speeds and is ideal where more than a 25% chip removal is required.

The alloys can be formed into any shape now possible through powder metallurgy fabrication. Tensile strength is about the same as for mild steel. Presently, the maximum size of a billet is confined to 22 sq. in. The alloys are especially well suited for use in the 200°C to 300°C range.

Potential applications range from brake linings, clutch facings, slide valves, bearings, guide rod bushings for die sets, valve guides. piston rings, brushes for motors and generators, gears, sliding surfaces of machine tools, to a host of other uses. License agreements for the manufacture of the new alloys are available.

Chemical Composition

Alloy	Weight percentage basic composition						Weight percentage range of impregnated lead
	Fe	Cu	Ni	Mo	Cr	C	
Bishiralloy A	Bal.	5.0	—	—	—	less than 0.2	15 to 30
Bishiralloy B	Bal.	2.5	1.5	2.5	—	less than 0.2	15 to 30
Bishiralloy C	Bal.	2.5	1.0	1.0	5.0	less than 0.2	15 to 30



This graceful span across the East Passage of Narragansett Bay is the first major bridge in the country to receive all of its protective coatings in the shop prior to erection.

LEAD GIVE

The idea of hauling a two-plus mile-long bridge into the shop for a paint job calls for either a touch of madness or a touch of genius. Smart thinking and hard-headed economics, however, dictated that one of America's spectacular new bridges receive its protective coatings in the shop prior to erection. "For the first time in the country, perhaps in the world, a major bridge has received all of its protective coatings in the shop before erection." So states H. M. Mandell, project manager for the consulting engineering firm of Parsons, Brinckerhoff, Quade & Douglas, in describing the Newport Bridge which his firm designed for the Rhode Island Turnpike and Bridge Authority.

Although radical in their in-shop painting technique, the paint contractors were traditional in their specification of lead anti-corrosive pigment. The formula developed for the primer was a two component read lead and epoxy composition, constituted as follows:

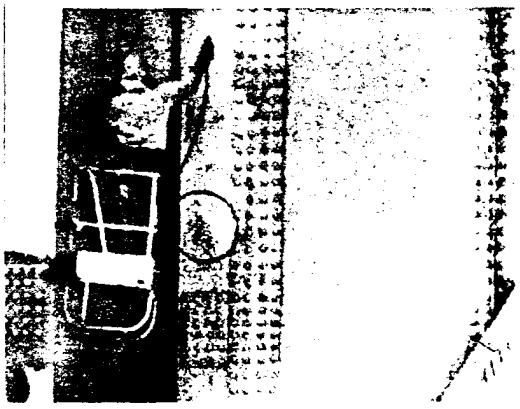
Component No. 1	
Combined Pigments 50.0% (±1.0%)	
Red Lead (97% Pb_3O_4)	80.0%
Siliceous Material & Bodying Agents	20.0%
	100.0%
Vehicle 50.0% (±1.0%)	
Polyamid Resin Solids	31.5%
Combined Solvents	68.5%
100.0%	100.0%
Component No. 2	
Epoxy Resin Solids	50.0%
Combined Solids	50.0%

An intermediate red lead primer of similar formula was also used. This, however, was tinted by the addition of 1% lamp black at the expense of the siliceous material in the pigment. Finally a green top-coat was applied.

After the bridge sections were fabricated and shop painted, they were moved to the bridge site for erection. When in place, the bolted field connections were then blast-cleaned, primed and painted. Touching up of the shop applied coat was also done where necessary.

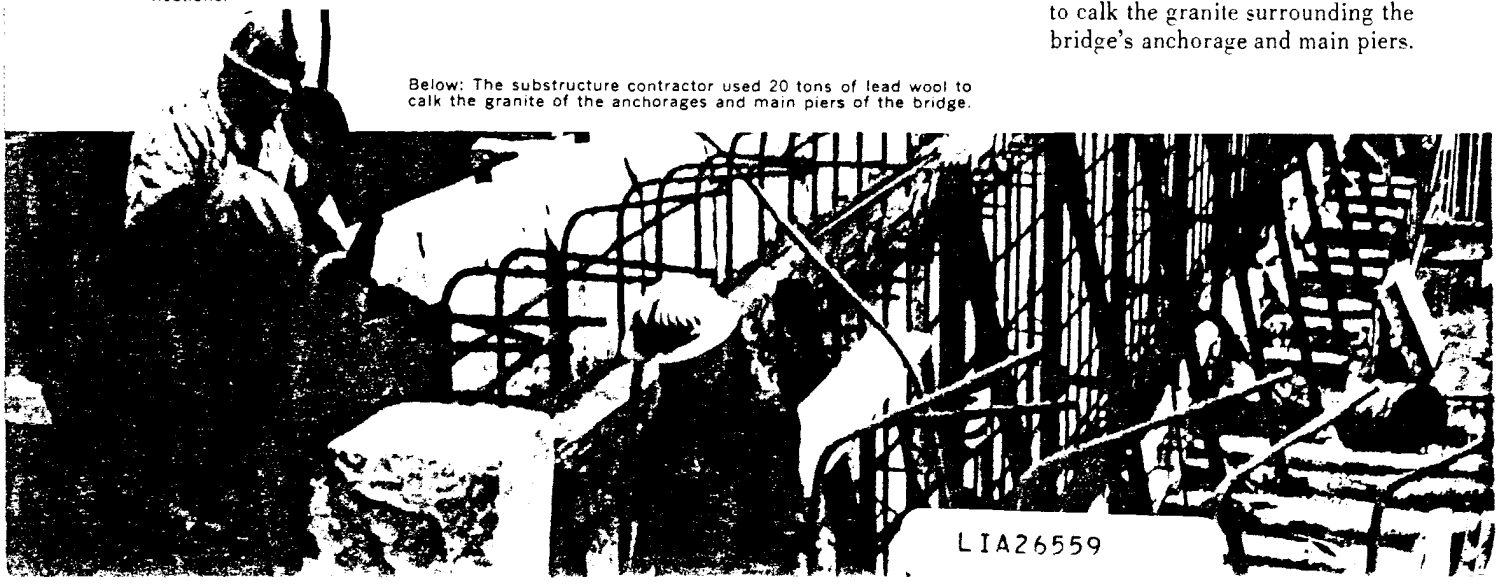
The structure has an overall length of 11.248 ft. and has a total suspension span of 2.976 ft. with the main suspension span of 1.600 ft. The towers rise 400 ft. above the surface of the water and the clearance at the central 400 ft. of the main span is 212 ft. above mean high water. The four lanes of concrete highway on the bridge now shorten travel time considerably between New York and Cape Cod by avoiding heavily congested traffic in the Providence area.

Besides the use of red lead primers to protect the superstructure, 20 tons of lead wool were also used to calk the granite surrounding the bridge's anchorage and main piers.



The only painting done on the site was for the protection of the bolted field connections.

Below: The substructure contractor used 20 tons of lead wool to calk the granite of the anchorages and main piers of the bridge.



GMENTS
ORROSION
E BRUSH OFF

The 80 year old Eiffel Tower has been a silent witness to the agony of history in its lifetime. Conversely it has also inspired young lovers as well as the talents of Debussy, Renoir, and Jules Verne who, among countless others, have lived and created within its shadow.

An understandable source of pride to Frenchmen despite its controversial beginnings, the Eiffel Tower has been meticulously cared for to insure its preservation. Throughout its history lead pigments have been used to protect the tower. Over 77 stories high and some 4 ft. taller than New York's Chrysler Building, the structure has been repainted every seven years to protect it against the inroads of corrosion. Lead, historically, has been used for these frequent beauty treatments because its ability to protect against corrosion insures that the tower will remain an emblem of Paris for many years to come.

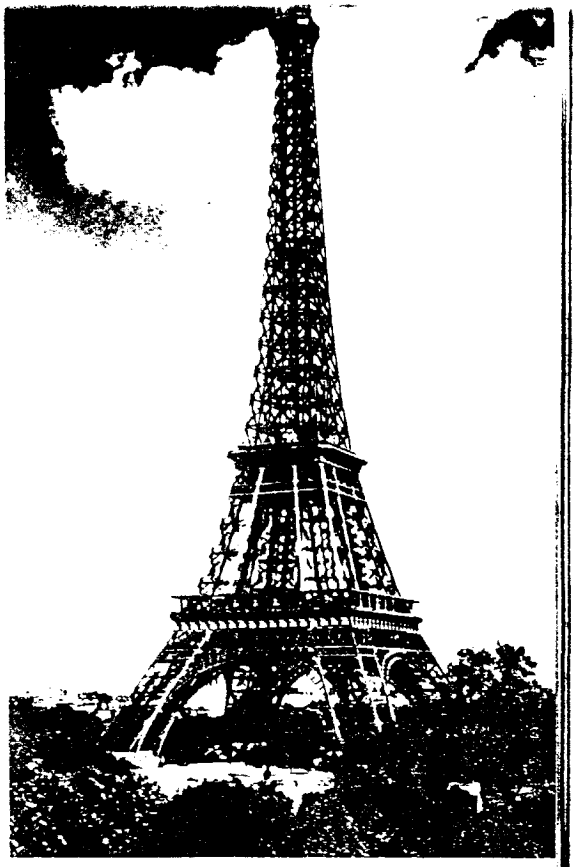
This past year, for the first time, the color was a beige-grey, the first departure from the traditional brown. The 50 tons of paint required for this project contained 7 tons of corrosion-resistant basic lead silico-chromate plus an additional 13 tons of leaded zinc oxide. The final paint formula was developed by Etablissements La Seigneurie of France.

Work started on this most recent painting job in April of 1968. It was suspended during the tourist season from June to October, and resumed in the Fall.

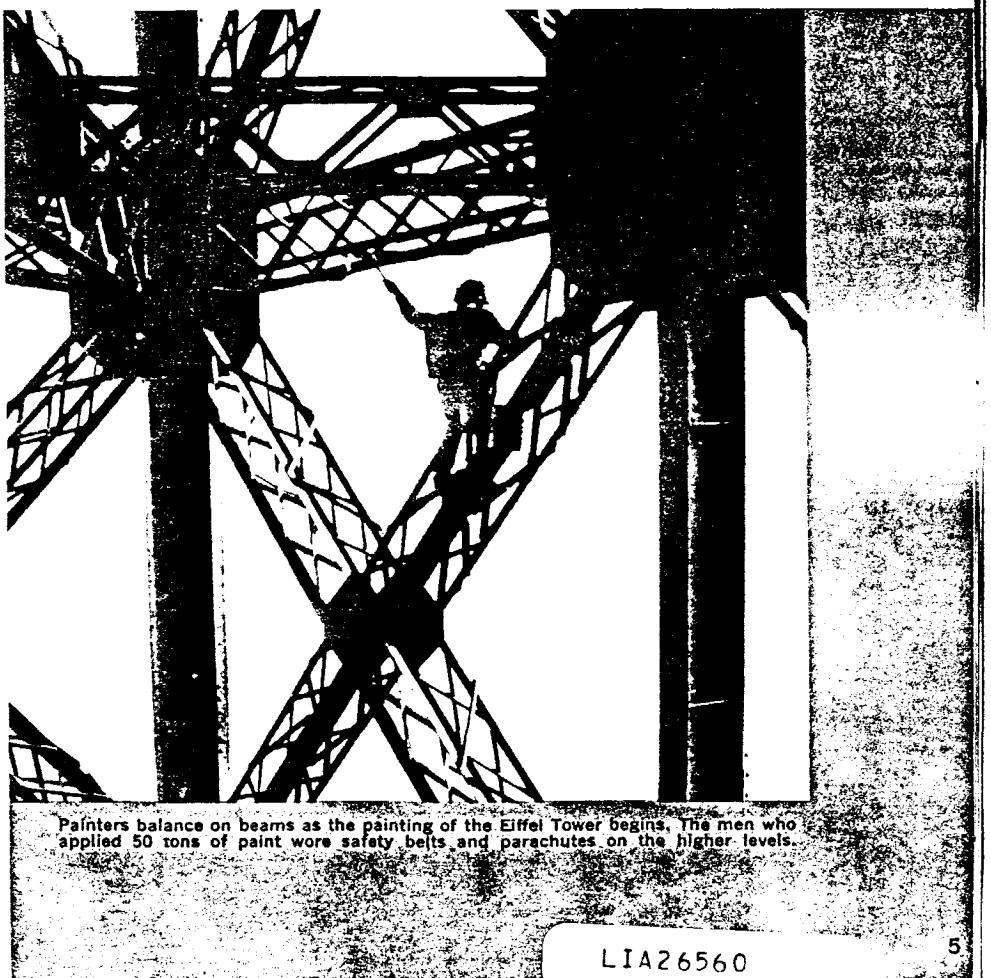
Over 20 painters were employed. Each worked an average of ten hours a day. Because of the great height of the tower, the men wore safety belts, and those on the higher sections also wore parachutes.

Below is the formula for the paint that was used:

	% by weight
Lead silico-chromate	14.0
Micaceous Iron Oxide	8.0
Synthetic Oxides	5.5
Leaded Zinc Oxides	26.0
TiO_2 (Rutile)	4.0
Linseed-Chinawood standard	28.0
Alkyd Resin	5.6
Bentone 34	0.3
Mineral Spirits, etc.	8.6



Built by Alexander Eiffel for the Paris Exposition in 1889 the tower was 984 ft. high. The tower is now 1,050 ft. high with the addition of a 66 ft. TV tower. It is the tallest structure in France, and ranks among the tallest in the world.



Painters balance on beams as the painting of the Eiffel Tower begins. The men who applied 50 tons of paint wore safety belts and parachutes on the higher levels.

Kennedy Space Center...

FIRST STEP BEFORE THE GIANT LEAP

A mere 15 years ago, even the most avid science fiction fan could not have envisioned the vast wonderland of advanced science and technology that now exists on Merritt Island. Florida. It is here that The National Aeronautics and Space Administration has built Launch Complex 39, the physical facility designed with the prime purpose of sending American astronauts to the Moon.

The Kennedy Moonport is more than a large area of concrete from which space vehicles are launched. It is, in fact. a large industrial complex where the gigantic Saturn V rockets are assembled and transported to the launch pads.

A broad roadway stretches from the rocket assembly area to the two launch pads located 5 miles away. Over this roadway a gargantuan crawler-transporter carries the completed space vehicle with its capsule and its launcher-umbilical tower to the pad.

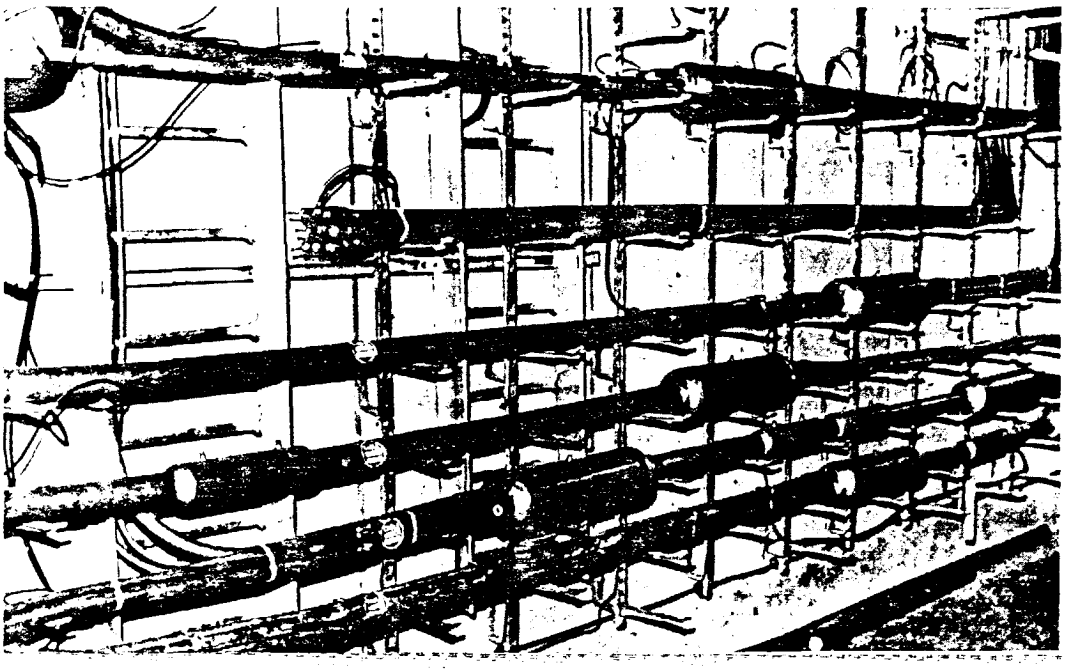
Another unseen roadway parallels this huge concrete ribbon. It is a lead sheathed cable system that connects the launch control center with the two launching pads. This carries the thousands of miles of wire that form the nerve center of the Moonport, a vital link between the ultrasophisticated launching equipment and the pads.

Here, maximum safety and reliability are a must. That's why lead sheathed cable was specified for the job. Not only was lead sheathing selected because of its impermeability to moisture but to provide a positive ground as well as permitting the use of a nitrogen purging system.

All of the equipment at the center that is not explosion-proof is connected to a system that fills the enclosures with a low pressure, inert gas. Using a similar system, the lead sheathed cables are also filled with nitrogen. The gas snuffs out any arc before it can cause an explosion and greater damage.

The lead cables are pressurized through fittings sealed into the splices. The cables, like all other metal objects, are grounded as an added precaution against accidental arcing.

In the great adventure of the Space Age, lead will help in more ways than just carrying the blast-off command. Lead glass sealed micro-circuits play a role in vital computorized flight control. Lead in a low temperature glass made it possible to reduce the size in the miniature integrated circuits in the airborne computor. By effectively sealing these IC's with glass a metal cap was eliminated, making the whole system both smaller and lighter weight.



Thousands of miles of wire that connect the launch pad complex with the launch control center are protected by lead sheaths for maximum safety and reliability. In addition to providing a ground, the sheath is impermeable to moisture and permits the use of a nitrogen purging system for added safety.

LIA26562

AT HOUSTON INTERCONTINENTAL AIRPORT... BATTERIES LIGHTEN THE LOAD

Above: Looking much like a blind mole, this automated train follows a magnetic guide path buried in the floor with unerring accuracy.

The lead acid battery powered vehicle has literally entered the jet age. At the same time, the days of the air passenger walking for great distances in and about terminals are numbered. An example of what's "in the wind" for the '70's is taking place at the Houston Intercontinental Airport. There the airport architects combined the use of battery electric vehicles and the unit terminal concept to reduce passenger walking to a maximum of three minutes.

This marks the first time such a system has been used at any airport. The trains provide free, rapid transportation between the two terminal buildings as well as to the parking lot escalators. The lead acid battery powered system was selected because, being quiet it was completely compatible with the underground route.

Four of these trains operate continuously through the air conditioned mall. Each consists of a motive power unit and three cars. The overall size of each train is 45 ft. long, 5 ft. wide and 7½ ft. high. Each car has a capacity of 8 passengers with their hand baggage. At present the units are handling in excess of 200 passengers in a peak 10 minute period. However, since the airport opened, plans are underway to expand capacity for passenger loads up to 600 people every 10 minutes as demand upon airport facilities increases. Present battery and train facilities are expected to be ample for the new capacities.

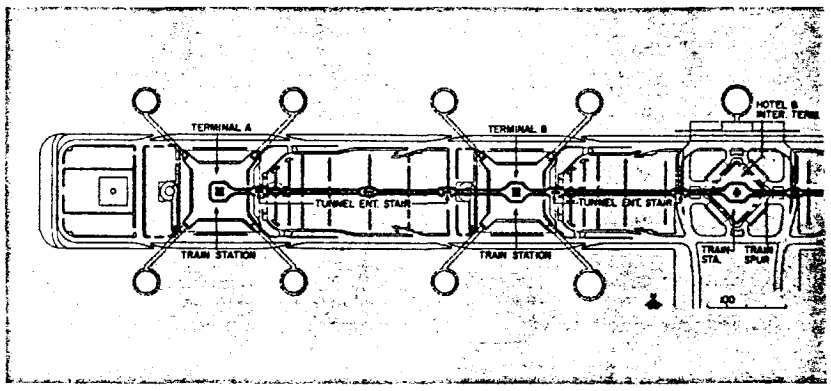
Each train has a guidance system that keeps it on course as it follows the magnetic field set up by a single energized wire embedded in the floor. Trains are kept at approximately two minute intervals by a zone blocking traffic control system.

In building the battery powered trains, safety and comfort were the principal design factors. One safety and convenience provision is an optical scanner which initiates an unscheduled stop if it "sees" any object in its path.

Safety edges of the elevator-type doors both on the train and at the station stops prevent injury. As on an elevator, if these edges touch any object the doors are automatically re-opened. They also prevent movement of the train until the doors are completely closed. Another safety feature is an electronic monitor which sends malfunction alerts to the central control station attendant, who mans a "railroad-type" panel map and console.

While on the move, each train inspects itself constantly and diagnoses its trouble, turning on selected lights both in the motive power

Below: Battery operated, electronically controlled trains now provide transportation on a regular schedule between the two existing terminal buildings. When Phase II is completed in the future, the line will be extended.



LIA26563

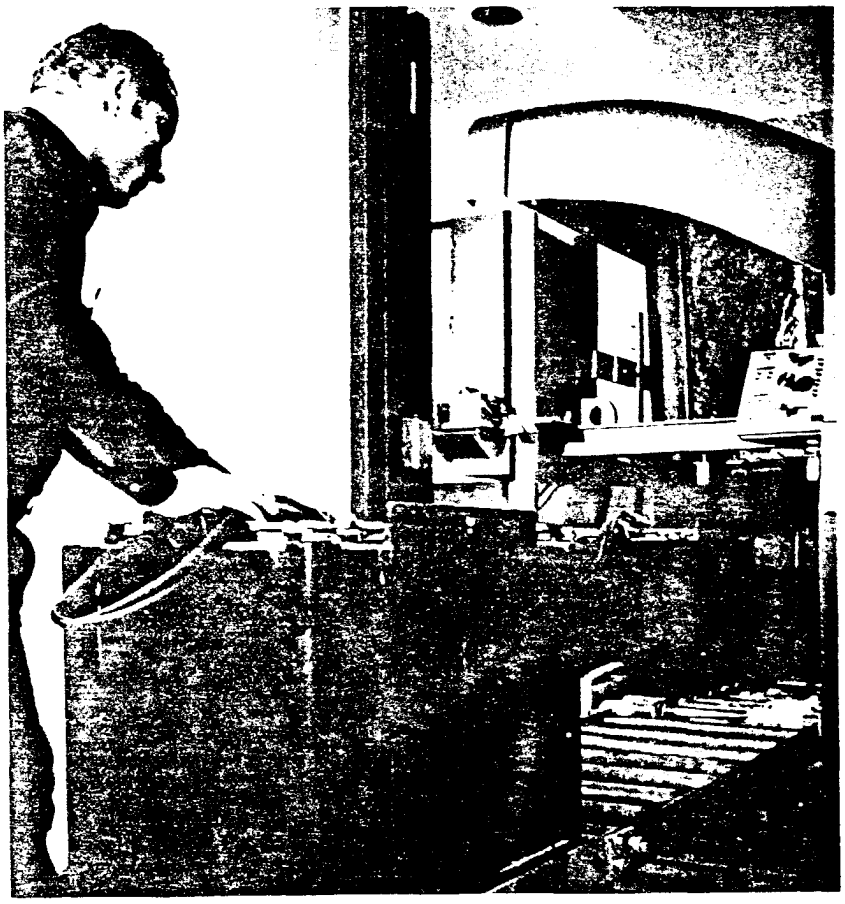
Above: Elevator type doors on both the cars and station platforms open automatically when the train halts for programmed stops. A safety interlock prevents the train from restarting if the doors are held open for any reason.

unit and on the central control panel. It pauses automatically at programmed stops to pick up and discharge passengers, announcing each location.

A system of magnetic patterns set in the floor "talks" to the trains in electronic code. The train obeys these instructions through an elaborate electronic system.

Two massive lead acid batteries supply all the power for the on-board computer and electronic system, as well as for the motive power which are controlled by solid state circuitry. Each of the train's batteries can be changed by a single attendant in only 80 seconds enabling it to operate on full power with minimum interruption. Electromagnetic brakes execute precision stopping with two-inch tolerances at stations. From full speed of eight miles per hour each train is smoothly brought to a complete stop in less than six seconds.

Trains of this nature could be adapted for use at other airports as well as in such areas as amusement parks, industrial complexes, shopping centers, motels, universities and metropolitan shuttles.

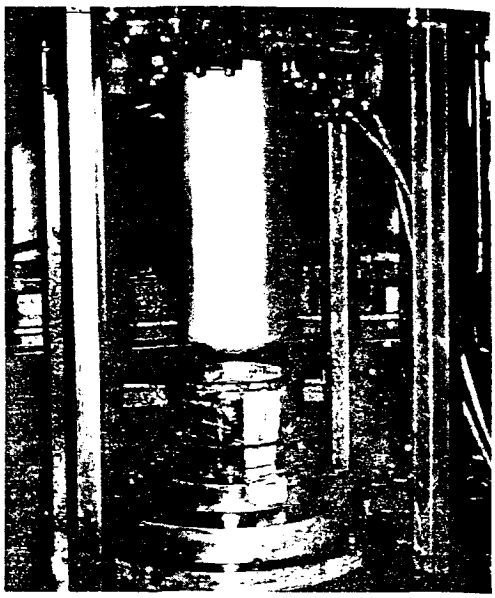


Above: The high density lead acid batteries that power the train can be changed by a single attendant in a matter of 80 seconds.

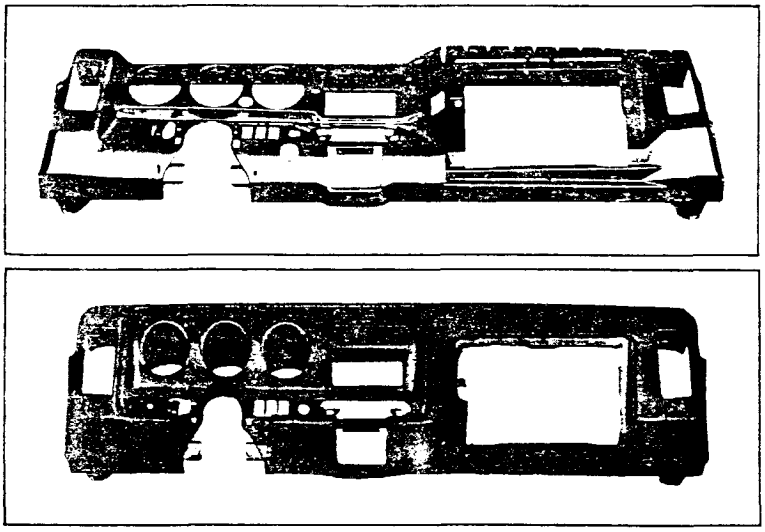
LIA26564

Lead Phosphate Coated Steel Increases Metal Stamping Production

The Metal Flo Corporation of Columbus, Ohio, specialist in deep drawing has experienced a production boost of over 260% through the use of lead phosphate coated steel.



Above: Starting with a large circular blank of lead phosphate coated steel, Metal Flo reduces it in four draws into a 10 in. diameter cylinder 30 in. long without the use of drawing oil.



Left: A mill applied lead phosphate coating on the steel stamping, shown at the top, makes it possible for the urethane foam, applied in a subsequent operation, to adhere to the metal to form a padded automotive dashboard, bottom view.

The metal cutting industry has long known the value and advantages of leaded steels. They have resulted in improved machinability, increased cutting speeds and longer tool life. Now, the metal stamping industry is rapidly learning that the addition of a lead phosphate coating to sheet steel speeds up stamping and deep drawing operations.

The lead phosphate conversion coating does not impair the weldability of the steel and it offers excellent corrosion protection during the entire fabricating process. In deep drawing, it serves as a lubricant, often eliminating the need for drawing oils and subsequent cleanup operations.

It provides an excellent paint base with low electric power requirements when used in the electrocoating process.

Metal Flo found that the use of lead phosphate coated steels has offered many production advantages. According to Mr. G. W. Rowden of Metal Flo, the company formerly was producing 300 tanks that measured 10 in. in diameter and 30 in. long for each eight hour shift. The change over to the use of lead phosphate coated steel increased the output to 800 tanks. Though four draws are required, no drawing oil is used. This represents a production boost that is very important to a contract stamper like Metal Flo. The use of lead phosphate coated steel was the most significant factor in this improvement.

Sheller-Globe Corporation, Keokuk, Iowa division, found that lead phosphate coated steels used in the stampings for their automotive dashboard consoles readily accepted urethane protective padding in a one-step molding. Previously it had been necessary to handcoat the steel so that the foam would adhere to the metal.

Many companies are changing over to the material with resulting increases in stamping production. Hot or cold rolled sheet steel with lead phosphate is now commercially available as a mill applied coating from Youngstown Sheet and Tube Company.

LI 426765

INTERESTING ODDS AND ENDS ABOUT LEAD

PUTTING MORE LIGHT ON SOLDERING

Adapting aerospace technology to the commercial field, the Aerojet-General Corp. has produced a lightweight, hand-held, two lamp heat gun for soldering and brazing in the air conditioning, plumbing, refrigeration and airframe industries. Operating on 115 volts AC the gun employs two 750 watt tungsten filament quartz lamps, capable of producing temperatures up to 1350°F. It gives very rapid fume-free, flame-free local heat on tubing and piping up to 1 in.

A HOLLANDER (FRIEND AND BUSINESS ASSOCIATE) COMMENTS ON U.S. MOON EPIC

Excerpt from a letter received at Lead Industries Association from J. F. H. van Eijnsbergen

Dear Jack:

Through this letter, destined to you and to all the men and women working in your office, I want to express my sincerest admiration, gratitude and respect for you: The American people, which — in an awe-inspiring scientific, technical and psychological effort — reached one of the greatest milestones in the world's history: the first step of men on another celestial body.

When I look back towards that famous 3rd July 1775, when George Washington took command of the American soldiers battling for freedom, it is indeed the greatest stride within less than two centuries any people or race ever has made. I congratulate the people, amongst which I have the good fortune to have so many friends, with this their finest hour in history.

When meeting Frank Borman and his family here (in Holland) some months ago, he expressed to me his feelings how great it was to him to visit such a small country.

Let me return to all of you his remarks, saying how proud I am to be so close a friend of your great country.

THE STARS AND STRIPES FOREVER.

yours sincerely.

LEAD ACID BATTERY POWERED FIRE TRUCK ANSWERS THE ALARM

The problem of providing quick response to any fires that might break out in a mammoth plant covering nearly 50 acres under one roof, has been solved at Automatic Electric Company, Northlake, Illinois, a manufacturing subsidiary of General Telephone & Electronics Corp. The company uses a highly reliable, lead acid battery powered, "in-plant" fire truck to speed to fires reported throughout the 2,000,000 sq. ft. factory, one of the largest in mid-America.

The bright red vehicle carries an assortment of fire extinguishers, hoses, lanterns, tools, gas masks, blankets, tarps, ladders, poles, fog nozzles, axe, crow bar, rope, 150 gallons of water, and 250 pounds of carbon dioxide. The unit is manned by a fire marshal and two assistants at all times.

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LIA26566

LIBRARY OF TECHNICAL INFORMATION

NEW LISTINGS

Lift trucks: Accent on muscle, and talent too.

Report discusses latest developments in the lift truck field together with future forecasts. Contains concise details on the economy of electrics. **L-8**

Microstructures and Magnetic Properties of Lead Ferrites.

Investigation of isotropic high lead ferrites shows they can be prepared with energy products greater than 1.4 x 10^4 G·Oe. Eight page reprint. **B-9**

The U.S. Lead Industry—1968

An annual review of activity within the industry that contains a general summary for the year and a series of charts and tables giving current statistics on lead production and consumption. **M-14**

ARCHITECTURAL

Lead armor soundproofs new arts center

Chicago's new Center for the Performing Arts is sheathed entirely in lead. A general description is given of the job and how the lead was handled. Four pages, illustrated. **A-7**

The effects of waste line effluents. on synthetic rubber gaskets for cast iron soil pipe

Synthetic rubber of a type similar to that used as gaskets in waste line joints was exposed to many effluents found in the plumbing waste system. Twelve pages, charts, tables and illustrations. **D-5**

CERAMICS

Phase equilibria and liquid immiscibility in the system PbO-B_2O_3-SiO_2

Describes detailed investigation of entire lead borosilicate system. Gives phase diagrams, rate of formation, time and temperature. Six page reprint, illustrated. **B-2**

CABLE SHEATHING

Lead sheathing for power cable

Design guide for use of lead sheathed power cable. Factors governing cable selection are also reviewed. Twenty-four pages, illustrated. **C-1**

PLUMBING

Will calked lead joints withstand high temperatures?

Describes tests on uncoated cast iron soil pipe with lead and oakum joints. Such joints were found to withstand temperatures to 170°F without leakage. Four pages, reprint. **D-4**

ANODES FOR CATHODIC PROTECTION

Lead-silver alloy anodes in cathodic protection of ships

Operating efficiency and behavior of lead-silver anodes for corrosion protection of ships. Other anodes are compared. Details of operation, costs and other important factors are discussed. Eight page reprint, tables and illustrations. **E-1**

PAINTS

Red lead based paint systems

Technical booklet lists properties and applications for twenty-four red lead paint systems. Specific uses, e.g. fresh water, marine, etc. suggested for a wide variety of formulations. Preparation of surfaces discussed in detail. Thirty-two pages, charts. **F-1**

ANTI-VIBRATION PADS

Ways to reduce press vibration

Two installations of lead asbestos pads to reduce heavy machinery vibrations. Sectional drawing and loadings are given. Two pages, illustrated. **G-1**

CHEMICAL CONSTRUCTION & CORROSION PROTECTION

Lead in modern chemical construction

Reprint from *Encyclopedia of Chemical Process Equipment*. Describes installation, proper design, application, and testing of lead linings. Twelve pages, illustrated. **H-1**

SOLDERING AND WELDING

Soldering alloys

Describes numerous alloys used as solders and discusses advantages and drawbacks of many. Flux requirements for soldering most metals, both ferrous and non-ferrous are listed. Four pages, tables and charts. **I-3**

SOUND BARRIERS

Practical application of sheet lead for sound barriers

Twelve page manual gives specific wall construction and performances. Tables, charts and illustrations. **J-1**

BATTERIES

Industrial truck cost calculator

Three nomographs permit estimation of costs for gas vs. battery powered industrial trucks in two or three minutes. Twelve pages, charts and tables. **L-1**

GENERAL

Publications and films

This booklet lists all the material currently available from Lead Industries Association, Inc. Sixteen pages. **M-13**

Primary lead production areas in the U.S.

For schools, libraries. 11"x14" map showing locations in U.S. of most lead smelters and refineries, and lead mines. **M-11**

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←TO REQUEST LITERATURE

MAIL TO:
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292 MADISON AVE.
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LIA26567