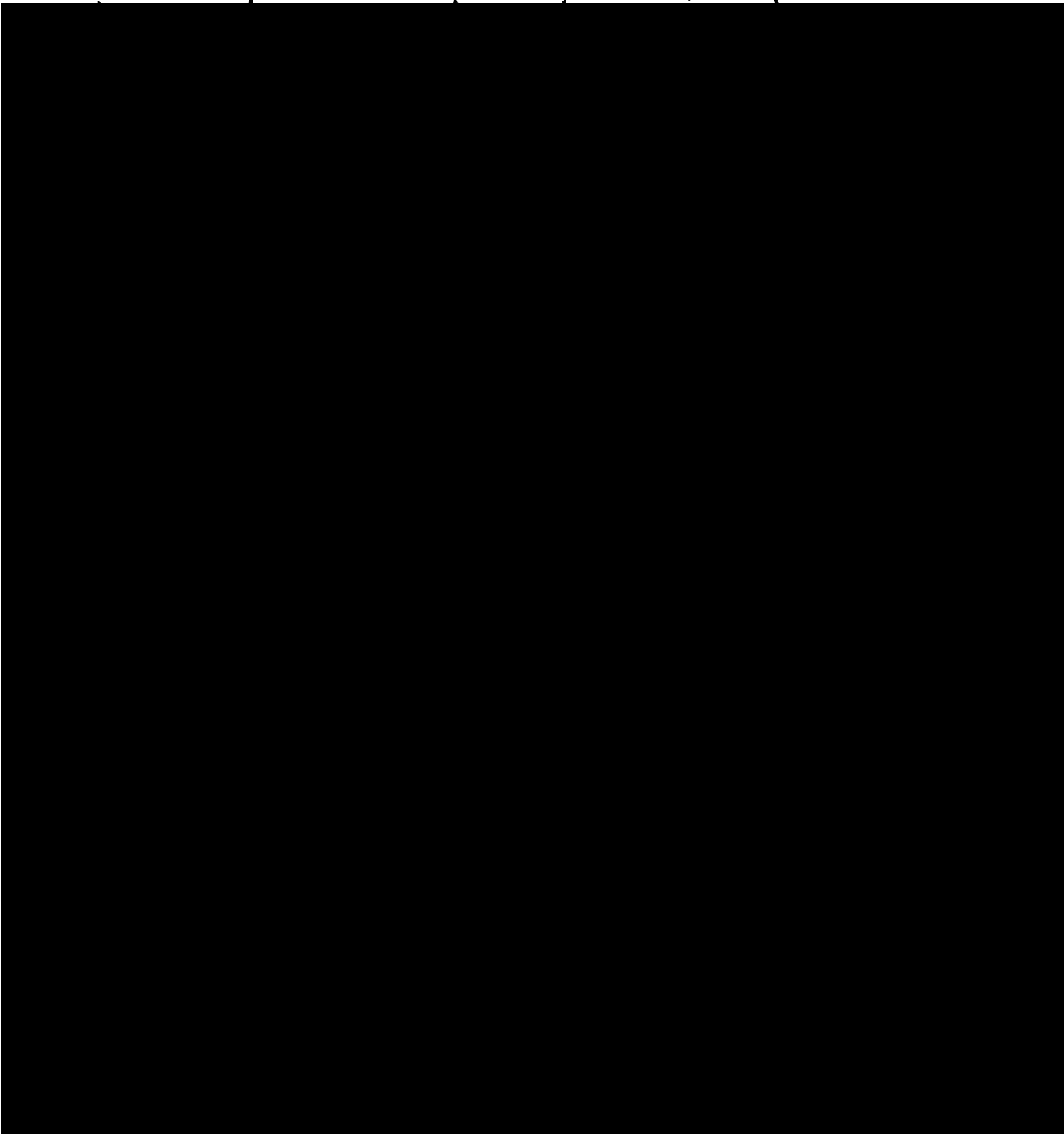




NEW MARKETS... NEW OPPORTUNITIES FOR LEAD

On the surface, it may seem strange that the lead industry, which for the last several years has been enjoying a reassuring period of increased consumption, should be seeking additional markets. Yet, that's exactly what's happening. And the search is likely to result in new opportunities for marketing of lead.

The reason for the current stepped-up market development activities stems from lead's heavy dependence on a single market—the automotive industry. In this prime sales area, lead is being phased out of gasoline in the United States. As a result, the lead industry must seek new markets for the lead formerly used in antiknock additives. There is also the need to create new markets for the lead used in automobile storage batteries as new competitive storage battery systems emerge. In the U.S., antiknock additives required 191,000 short tons and storage batteries 960,000 short tons out of a grand total of 1,517,000 short tons of lead consumed in 1978.

The logical way for the lead industry to overcome its present market dependence on gasoline-powered automobiles is to develop new uses and markets for batteries. A most promising new application for batteries is to power what many people believe to be the next generation of vehicles—electric cars. The lead industry and the federal government have committed millions of dollars for research and development of improved lead batteries to power electric vehicles and hybrid vehicles, the latter powered by batteries and another power source. Many thousands of these vehicles are expected to be in use on the nation's streets and highways in the next five years.

The lead industry also is taking a hard look at other battery markets that might be expanded. One such market is in the electric utility industry, where



opportunities exist for large numbers of batteries for load-leveling purposes.

Another exciting area which should provide a potential growth market for lead batteries is the solar electric energy industry. As this industry grows there could be a large-scale need for lead batteries to store solar generated electric power in remote locations and eventually for use in homes and commercial establishments.

Last, but not least, lead with its superb sound-barrier characteristics, should find wider use in reducing noise

While the problem of the heavy dependence on the automotive market should not be underestimated, recent activities by the lead industry show that it is determined to solve its problem by finding new and expanded outlets for this important, strategic metal.

W. T. Meyer

W. T. Meyer
President

Acoustical curtains come down on noise

Gates Learjet Corporation has installed lead impregnated curtains at its Wichita, Kansas plant to muffle the noise from riveting operations. The company was concerned about the effect of high noise levels from splice plate riveting on jet aircraft assembly personnel at the plant.

The area of concern centered on the manufacturing location where aircraft wing sections are assembled. The production sequence in which splice plates join wing sections through pneumatic riveting operations creates noise levels ranging from 118 to 122 dBA.

Noise levels generated within the machine shop and wing final assembly areas were less than 80 dBA (time weighted average). However, the higher noise levels produced by the splice plate operations overlapped into these areas.

Frank Gagne, Jr., supervisor, Safety & Industrial Hygiene, at Gates Learjet, said high noise levels created morale and fatigue conditions which reduced effectiveness of workers in the adjacent

areas. Although personal protective equipment (P.P.E.) was being used by these employees, Federal Safety Regulations require engineering controls be exhausted before P.P.E. can be utilized for compliance purposes.

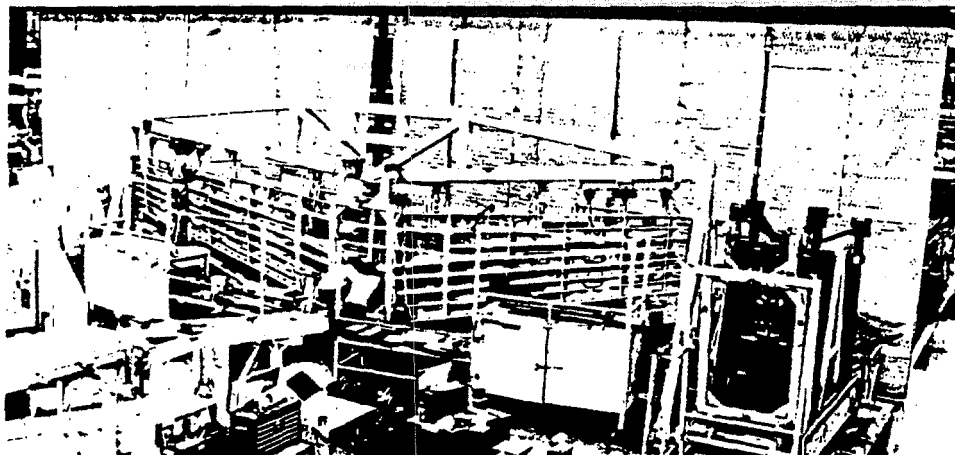
Because noise containment and vibration dampening are essentially the only engineering controls available for pneumatic riveting operations, the company chose to install Quil/Teez[®] acoustically-insulated panels around the wing shop area. These panels, manufactured by Noise Control Associates, Inc., Montclair, N.J., combined lead and fiberglass enveloped in an aluminized glass cloth to act simultaneously as a noise barrier and a noise absorber—the fiberglass absorbs noise energy while the lead septum acts as a transmission barrier.

A pair of 20-foot x 30-foot Quil/Teez curtains were hung on reinforced grommets and bolted to an overhead track. One particular section of the wing was selected for the evaluation of the curtain's effectiveness to insure that con-

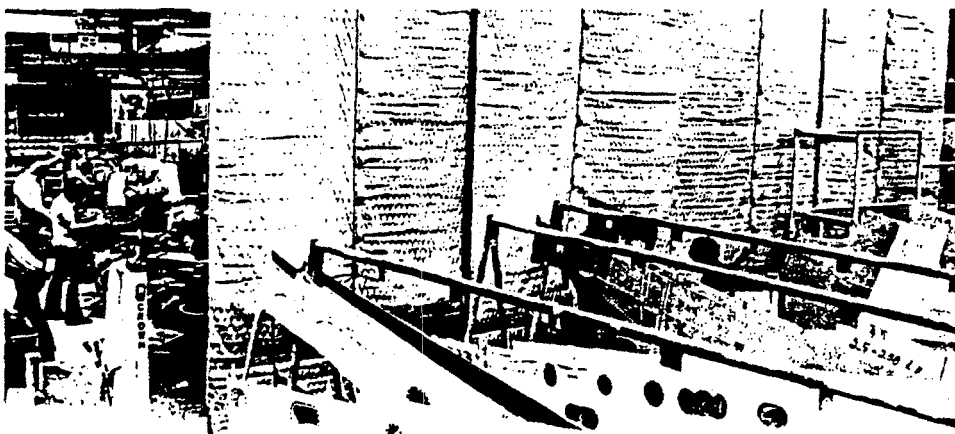
stant sound pressure levels were being surveyed.

Readings were taken using a sound level meter and graphic level recorder. The meter was positioned in the machine shop (12 feet from the noise source) and readings were taken—first with the curtains open and then with the curtains closed. The reductions achieved through the use of the noise attenuating/absorbing curtains was 10-12 dBA.

According to Frank Gagne, the installation of the acoustical curtains "has improved employee morale, eliminated the need for hearing protection in adjacent areas, and, hopefully, will increase production, reduce fatigue and errors in the machine shop and wing final assembly areas." He points out: "Lead is an excellent choice for noise attenuation for problems similar to ours." He also adds that bags filled with lead shot or sand and used as vibration dampening devices can help to obtain as much as a 7 dBA reduction in sound pressure levels in certain operations.



Wing Shop Area. With leaded acoustical curtains closed, workers in the adjacent areas of the wing final assembly and the machine shop are protected from extremely high noise levels from pneumatic riveters used in this location.



Splice plates being riveted. Acoustical curtain in background prevents high noise levels from overlapping into adjacent areas.

Lead paint gives facelift to 70 year old bridge



New York City's Queensboro Bridge. View is from Manhattan toward Queens with Roosevelt Island complex at lower left.

It is called the 59th Street Bridge by most New Yorkers although its name is officially the Queensboro. As its name implies, the structure connects the New York City borough of Queens with Manhattan.

Spanning the City's East River, the Queensboro Bridge passes over Roosevelt Island, situated in the middle of the River. When it was completed in 1909 the bridge was the largest, longest and heaviest cantilevered bridge ever built, and it remains one of the largest of its type today. Originally designed to carry pedestrians and the Second Avenue elevated subway as well as trolley cars—both transportation systems are no longer in use—the bridge carries 144,000 vehicles per 24-hour period, making it one of the busiest of the City's no-toll spans.

The Bridge is currently being repainted, a task that will take two years and 40 full-time painters. Since the Queensboro has been designated as a New York City Landmark, the final color scheme had to be coordinated between the City's Landmark Commission and the Department of Transportation (DOT). The structure's steelwork will be a tan while its four towers will be painted brown. A brown horizontal stripe will also adorn the bridge.

About 64,000 gallons of lead-based paint will be used in two coats to cover the bridge. A key element of the primer is the basic lead silico chromate anti-corrosive weather-resistant protective pigment. It is the lead pigment that provides a durable and compatible paint that offers superior corrosion protection.

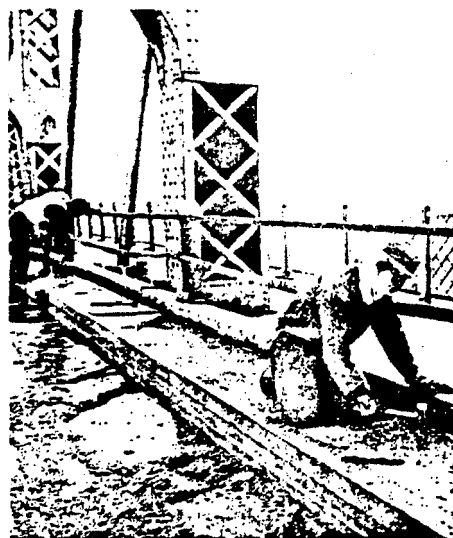
DOT reports that lead-based paints

have been used on New York City bridges since they were constructed because these paints provide the durability and weatherability required for steel structures. Following the application of the primer an alkyd finish or top coat, also containing the basic lead silico chromate, will be applied.

Prior to painting, old paint, rust and dirt had to be removed. Power-driven chippers and wire brushes were used to remove rust and rust scale. Hand chippers, scrapers and wire brushes were utilized to remove pitted paint, dirt, cement stains and deposits, and oil and grease which had accumulated over the years. Inaccessible areas, large accumulations of oil, rust and grease around expansion joints and all other areas were cleaned by a brush-off blast cleaning method.



Lead-based paint is applied to steel structure of Queensboro Bridge. About 64,000 gallons will be required to protect the bridge from corrosion.



Workmen remove old paint and rust prior to application of anticorrosive lead paint.

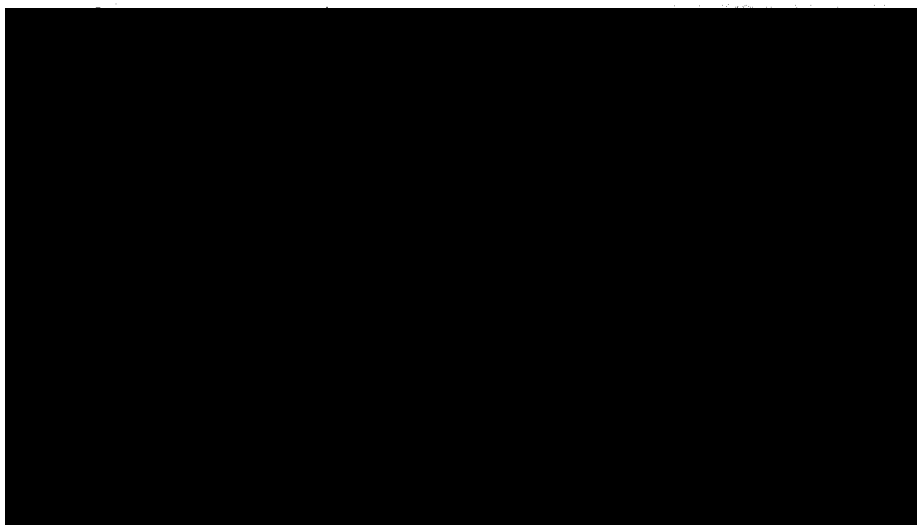
CERTIFICATE OF FORMULATION

PRIMER

Pigment	65%	
Basic Lead Silico		
Chromate	95%	
Red Iron Oxide	4.5%	
Susp. Agent	.5%	
Vehicle	35%	35%
Raw Linseed Oil	48%	
Alk. Res. Sol.	22%	
Thinner & Drier	30%	

Source: Amsterdam Color Works, N.Y.C.

Beveled glass—A new idea from an ancient art



Leaded and hand-beveled glass door and side panels create flawless prism effect and add distinctive look to a home.

The ancient art of stained glass has been updated through the use of beveled glass arranged in a variety of designs, all joined by lead. The shaped glass pieces are joined using lead comes, or H-shaped strips, with each joint overlapping the glass and soldered on both sides of the panel.

Beveled Glass Industries, Los Angeles, CA, is typical of several companies that specialize in producing beveled glass. With showrooms in New York and Los Angeles, the company has earned a reputation for high quality beveled glass products. They include doors, windows, tables and architectural accents.

According to the company, the increased interest in beveled glass is due to the fact that today people want the look of handcrafted objects rather than the artificial look of many materials that currently are found in homes and offices. Beveled glass is hand-set in much the same manner as stained glass. The highly artistic designs are not only beautiful, but they are less expensive than stained glass.

The first step is to bevel $\frac{1}{4}$ -in. or $\frac{1}{2}$ -in. thick clear glass in the design that will be required for each production piece. The bevels create prisms so that light refraction creates eye appeal

rather than color, as in stained glass. All beveling is done by hand, and a number of time-consuming steps are required for the beveling operation.

After the glass sheets are cut into various shapes and hand-beveled, they are laid on a piece of paper that serves as the pattern for the design. The pieces are assembled somewhat in the same manner as a jigsaw puzzle. One section becomes the foundation for another section.

After the beveled glass segments have been placed on the pattern, the individual pieces are joined by lead coming. The coming forms the channel for the glass in much the same manner as a window frame holds glass.

When all the pieces have been fitted, the lead comes are soldered to tie the joints together. The completed piece is then put into a temporary frame, ready for shipping.

At Beveled Glass Industries, more than 500 specially-trained artisans work together, thus increasing productivity. Each worker is responsible for completing a separate operation.

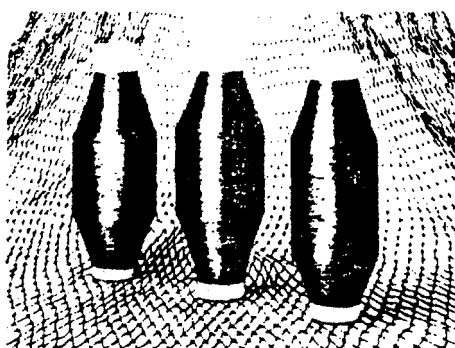
The operation has been designed to save time and effort. For example, it has been estimated that if one man were to create a 22- $\frac{1}{2}$ -in. x 66- $\frac{1}{2}$ -in. door piece from beginning to end, it would take approximately three weeks to complete. At Beveled Glass, the mass production technique accomplishes the task quickly and efficiently in such a manner that many pieces can be finished in one day.

Encapsulated lead improves fishing net performance

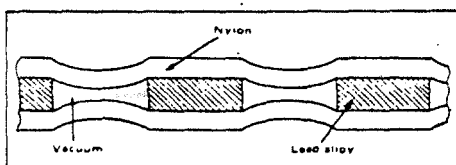
The use of a lead-cored nylon yarn has significantly improved the performance of Japanese fishing nets. The new yarn provides the heaviness, softness and water resistance required for efficient net operation.

In order to snare fish effectively, a net should hang as deeply as possible in the water, and show minimal change in angle with tide and current. This is usually accomplished with the use of weights. However, this makes the nets difficult to manipulate and the weights are often lost. And since the introduction of lighter plastic nets, the problem of maintaining a suitable fishing angle has increased.

One Japanese company, Mitsui Mining & Smelting, discovered that net yarn composed of a lead core plastic monofilament could achieve the desired effect



Lead-cored nylon yarn has improved Japanese fishing net performance.



tiveness. The monofilament is produced by simultaneously extruding nylon and molten lead alloy through a spinning equipment nozzle. The extruded product is then drawn to produce the final configuration shown in the accompanying diagram. The lead alloy segments are enclosed in a continuous nylon sheath with vacuum spaces in between. These spaces are formed between the lead alloy segments during the drawing process.

Dr. Y. Yamanouchi, who heads Mitsui's research activities, reports that successful tests were conducted with set nets made of the new material. These nets are anchored in place in relatively shallow water (about 30 meters). According to Yamanouchi, the new nets trapped up to eight times as many fish as the conventional type.

LEAD

The Lead Industries Association is a non-profit trade association representing the lead industry in the United States and Canada.

Its membership includes representative firms from all segments of industry and all parts of the world.

The Association neither produces nor sells lead, but collects and distributes information relative to the uses of the metal.

The services, publications and films of the Lead Industries Association are available without charge to anyone interested in the use of lead and lead products.

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Amax Lead & Zinc, Inc.
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ASARCO Incorporated
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Powerlab Inc.
PPG Industries, Inc., Chemicals
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Price Metals, Inc.

Quenell Enterprises, Inc.

Refined Metals Corporation
Republic Metals Co., Inc.
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Schuylkill Metals Corp.
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292 Madison Avenue, New York, N.Y. 10017**

ARCHITECTURAL

Lead Roofing and Flashing

Detailed instructions on the simplest and most useful methods for forming of joining lead for roofing and flashing applications. Complete specifications. Diagrammatic drawings. Sixteen pages. A-5

Lead in Building

A four-part data sheet containing information on waterproofing, sound barriers, roofing and flashing and anti-vibration application. A-13

CERAMICS

Facts about Lead Glazes for Art Potters and Hobbyists

Detailed information on the proper formulation, firing techniques, handling, etc. of lead fluxed glazes used by art potters and hobby ceramists illustrated. Sixteen pages. B-11

Proceedings of First International Conference on Ceramic Foodware Safety

Top international experts in ceramics, Food and Drug Agency officials and the international lead research community met in Geneva in November 1974 to discuss heavy metal release from glazed ceramic foodware. Full proceedings—speeches as well as question and answer dialogues—were filmed, translated and transcribed. 177 pages. B-13

PAINTS

Lead Pigments Bulletin

Brochure, 12 pages, describes the advantages and varieties of lead pigments in anti-corrosion paints. Covers red lead, dibutyltin lead, dibutyltin, basic white lead, basic lead phosphosphate, basic lead chromophosphate, basic lead silico chromate. Lists major suppliers. F-7

CHEMICAL CONSTRUCTION & CORROSION PROTECTION

Lead for Corrosion Resistant Applications

Self cover book, 156 pages, designed to familiarize engineers and engineering students with the corrosion resistance of lead and lead alloys in acid and lead based environments. Defines corrosion, corrosion resistance of lead, and corrosion resistance of alloys. H-6

Lead Chemicals

Self cover book, 12 pages, is designed as a working manual for the chemical or chemical engineer concerned in the application of lead in various forms. Covers: lead compounds, compounds, oxides, and hydroxides; sulfides and tellurides; hydrides; binary compounds; lead salts; lead alloys; safety in handling compounds. Full charging price \$1.50. H-7

SOLDERING AND WELDING

Solders and Soldering

New 16 page booklet filled with basic information on soldering and the selection of the right solder alloy for the application. Data is presented on a variety of tin lead as well as other solder alloys. Several case history treatments of typical soldering applications are included. I-6

"Solder Puts It All Together for Manufacturer of Zippo Lighters"

Two page reprint from Production Magazine details production soldering of lighters at Zippo Mfg. Co. I-7
Printed in U.S.A.

Soldering of Electronic Products

Booklet covers the use of tin lead solder as a highly reliable joining method in the electronics industry. It includes information on the control of electronic assembly components for solderability, fluxes and flux residue removal, solder alloys and soldering methods. I-8

SOUND BARRIERS

Directory of Acoustic Specialties

Summary of available materials for sound insulation by barrier, damping and absorption methods. Sixteen page list of materials by brand name and manufacturer. Eighteen pages. J-4

Lead a Major Factor in New Machinery Noise Suppression Systems

Description of techniques used to lower machinery noise levels with lead and lead composites. Lists machines that normally exceed noise level allowed by Walsh Healey Public Contracts Act. Two pages. J-9

Lead Proves a Heavy Favorite as Sound Control Material

A reprint of a feature from Product Engineering illustrating lead's usefulness in sound attenuation to help meet OSHA noise requirements in factories and also on planes and trains. J-17

Specifying Lead for Noise Control

Eight page reprint contains guidelines to help architects and engineers fully utilize the advantages of lead as a noise control material. A number of case histories are included to show how some of these guidelines were used to solve a variety of commercial, industrial and residential noise problems. J-18

The Use of Absorber/Barrier Materials for Noise Control Enclosures

Four page reprint is concerned with noise abatement applications within the 10 to 10,000 Hz range. It describes an installation using a leaded absorber barrier enclosure suitable for achieving these reduction levels, and presents the advantages of the material. Acoustical, economic, operational and maintenance aspects are discussed. J-19

Take a Fresh Look at Noise Control

The four page reprint from Modern Metals & Alloys captures the uniqueness of sheet lead primary batteries for office space noise control. A case history illustrates how lead's low noise level, treatment and cost savings realized. J-20

Modern Uses of Lead in the Construction Industry

This 20 page booklet covers significant uses of lead in construction applications. It deals chiefly with lead for plumbing, waterproofing, roofing and flashing, anti-vibration and sound barriers. J-21

Why Everyone's Shouting About Noise Control

Reprinted feature from Iron Age discusses the use of sound absorbing materials such as lead to meet increasingly stringent noise control standards in industry. Includes a simple rules on lead's use to insure successful application. J-22

Lead: A Vital Tool For Industrial Noise Control

This 26 page booklet focuses on the use of lead as a barrier to block sound paths and for dampening structures and surfaces to reduce vibration and radiation of airborne sound. It deals with applications of lead sound attenuation materials and offers practical solutions to noise control problems. J-23

Lead For Radiation Protection

This 26 page guide provides radiation shielding properties, design and fabrication information on lead and lead-based products. Basic applications for lead shielding are outlined and current construction materials and techniques of applying lead as part of a radiation protection system are described and illustrated. K-3

BATTERIES

A Primer on the Lead-Acid Battery

A condensed story of the principles of the lead acid battery and its chemistry, including some of the fundamentals and definitions of direct current electric energy. Two pages. L-6

Electric Work Vehicles

A 12 page folder describing battery powered short-haul delivery vehicles and comparing their economics to internal combustion delivery trucks. L-19

Saving Battery Dollars—What You Need to Know

Three-part reprint from Modern Materials Handling deals with proper procedure in picking the right battery for the truck and job. It also discusses considerations in battery charger selection. The third part offers guidelines for planning an efficient battery charging room layout. L-23

Electric Vehicles: State-of-the-Art 1978

New 24-page booklet contains latest data on electric trucks, buses and passenger cars around the world. Case histories describe EVs in a variety of work applications. Other sections cover energy crisis and pollution problems and their effect on EVs and the role of lead batteries in EV development. L-24

GENERAL

Primary Lead Production Areas in the U.S.

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

The U.S. Lead Industry

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

Lead—a Modern Design Material

Summary of properties and available forms of lead for radiation control, sound/vibration control, electrical energy sources, soldering and ceramics. Eight pages. M-15

Ecology in the New Lead Belt

Reprint describes cooperation of industry and environmentalists in developing southern Missouri lead mines. Four pages. M-23

Leaded Grades: Answer to Free-Machining Needs

Reprint reports on benefits derived from using leaded steels for free machining. Case histories are employed to demonstrate that these grades can enable partmakers to raise production of quality components with efficiency and economy. M-32

Lead and Zinc Outlook 1976-1980

Booklet examines demand prospects and production for lead and zinc over the next four years. Current markets and growth applications are also discussed. 16 pages. M-33

Occupational Lead Poisoning . . . It Doesn't Be . . . A Manual for Managers

Contains information of use to the industrial manager on the safe handling of lead and lead products in industry. Types and permissible levels of occupational lead exposure are discussed. Some practical controls and safeguards are suggested. 16 pages. Bibliography. M-34

Lead and Your Health

Brochure contains advice on occupational protection against over exposure to lead. A checklist of good health practices is included. M-35

Old Paints and Rural Lead Poisoning

Booklet discusses the incidence of lead poisoning among children in small towns and rural areas, a problem usually associated with big cities. The need for lead screening programs to detect and correct the problem is emphasized. M-36

Directory of Lead Casters

Booklet lists 56 companies throughout the U.S. that produce lead products. Industry. Data on each firm includes type of casting method, products produced and auxiliary services offered. A contact name at each company is provided. M-37

FILMS

Lead in Motion

A 21 min., 16mm color film. Lead's properties and its potential for unlimited future applications are explained from the viewpoint that an alloy of lead is an elemental matter—its arrangement of energy, part of a complex system. In some speed, desired speed data and alternate data. No charge to borrow, viewer pays only return postage. N-7

Occupational Lead Poisoning . . . It Doesn't Be

A 16 min., 16mm, sound film has been rated by the environmental health experts of international caliber. The film introduces the basic principles of a health program for the lead industry. The intention is to motivate the cooperation of both management and employees in developing an effective health program for their particular operation. To order, specify desired show date and show, one alternate date. Allow at least five weeks for delivery. No charge to borrow, viewer pays only return postage. N-3

Lead For Noise Control

Audio visual presentation covers lead based materials available to control noise in an industrial environment. Actual case histories included to document effectiveness of these materials. Available as a cassette with slides or a continuous loop 16mm film strip with magnetic audio tape for \$15.

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