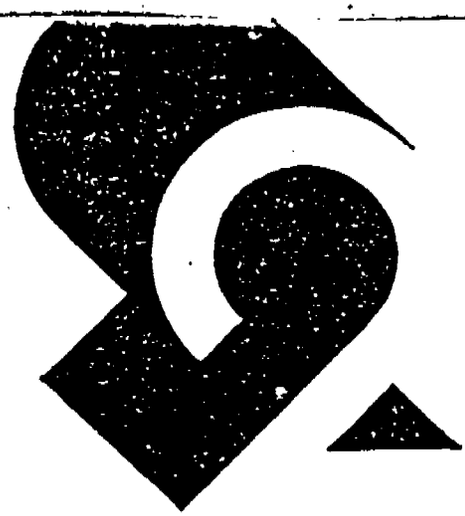

Lead

WHAT IS IT? Lead is a soft, dense, malleable, heavy metal with a low melting point. It is gray in color and because of its characteristics, has a wide application of uses.

WHERE IS IT? Lead is used to make printing type and plumbing, shield telephone and power cables and to protect against radiation hazards. As an alloy, lead mixed with steel makes excellent bearings. As solder, lead alloy is vital in the electrical and electronic industries. Lead compounds are used to make paints and ammunition, and lead oxides are used in car batteries.

WHAT IS THE HAZARD? More than 1.6 million employees in nearly every industrial manufacturing process and in many service industries are exposed to the poisoning effect of lead. Lead can enter the body by inhalation, absorption through the skin or by ingestion. In sufficient quantities, the result is the same—severe gastrointestinal, blood and central nervous system disorders. Inhalation of lead dust or fumes is the most frequent means of entry and results in most of the industrial health problems involving this metal. Lead is a cumulative poison. A part of a small daily dose is not eliminated, but is stored in the body. Eventually, a point is reached where symptoms and disability—even death—occur.

HOW IS IT CONTROLLED? Since the primary route of industrial lead poisoning is inhalation, enclosure and local exhaust ventilation are the principal means of control. Daily wet or vacuum cleaning of all lead dust, personal hygiene, prohibition of food and beverages in the work area and use of U.S. Bureau of Mines-approved respirators are other means that can help control exposure.

WHAT ARE APPROVEL LEVELS? OSHA's permissible level is 0.2 milligrams per cubic meter of air for an eight-hour, time-weighed average airborne concentration. Imminent danger situations are not generally applicable. Any exposure above 0.6 milligrams per cubic meter of air for an eight-hour, time-weighted average is considered a serious violation. Levels above 0.2 and less than 0.6 are considered regular or nonserious violations.

HOW IT IS MEASURED? The sample is collected for a minimum of 60 minutes by a personal sampling pump on a millipore filter. The filter is subsequetly dissolved in nitric acid taking the lead into solution. The solution is then introduced into an atomic absorption unit for analysis.

Carbon Monoxide

WHAT IS IT? Carbon monoxide is a colorless, almost odorless, tasteless, nonirritating gas. It is produced by the incomplete combustion of fuels, such as wood, gas, coal, oil and gasoline. Miners refer to it as "white damp."

WHERE IS IT? Carbon monoxide is found anywhere carbonaceous fuels are used. It can be found in everyday activities as well as in industrial situations—near incorrectly vented gas heaters, near gasoline-powered machinery and around automobiles run indoors, blast furnaces, and catalytic reduction operations.

WHAT IS THE HAZARD? Because it is found so widely, nearly everyone, at one time or another, is exposed to carbon monoxide. The danger lies in inhalation of gas. Carbon monoxide enters the blood stream through the lungs in the same manner as oxygen, but it displaces oxygen in the blood because it has approximately 210 times greater affinity for hemoglobin in the blood than oxygen. As a result, the blood cannot transport oxygen, causing suffocation even in an atmosphere containing ample oxygen. Fortunately, regardless of how high the percentage of saturation of the blood has been, practically all carbon monoxide is eliminated by the body within 8 to 10 hours after exposure ends.

HOW IS IT CONTROLLED? In general adequate ventilation will prevent carbon monoxide poisoning. Enclosure, general or dilution ventilation and

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Looking Ahead

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a threat to your health or safety, don't gamble. Use precaution. Don't be careless.

Finally, and perhaps most importantly, develop a "safety consciousness." Don't think that accidents only happen to "the other guy." They don't. They can happen to anyone, and unless you obey safety regulations, unless you wear and use safety equipment, unless you pay attention to your work environment, they can happen to you.

I don't have to tell you of the tragedy that accompanies a serious work accident. Hundreds of thousands of workers are injured each year in work accidents. Often they are permanently disabled. Productive Americans are taken out of the work force; families suffer when the breadwinner is unable to work. On a larger level, the economy suffers.

Before writing this article, I decided to check the accidental death figures for I.U.O.E. members over the past ten years. From 1963 through 1972, we lost 3,124 good men through work accidents, an average of about 312 men each year. Here are the cold figures: 1972—299; 1971—298; 1970—313; 1969—342; 1968—335; 1967—370; 1966—280; 1965—354; 1964—267; 1963—266. How many of these deaths could have been prevented, I cannot say; probably a great many of them. This year, through the first five months alone, 151 members of the International have died in work accidents. At that pace, we again will have more than 300 men die on the job. Hundreds more will be injured.

That is unless you do something about it. Not "the other guy." You. The part you can play is immeasurable. By wearing proper safety equipment, by following safety procedures, by avoiding carelessness, by using the OSHA regulations wisely, by developing a safety consciousness, you can do more to cut down on work injuries and deaths than any group, organization or agency.

The challenge is there. It is up to you to accept it. *You* can do much for safety!

Target Health Hazards

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local exhaust ventilation, as well as isolation of hazardous operations are the principal means of preventing employee exposure to dangerous concentrations. Automated detection alarm systems also are useful control measures.

WHAT ARE APPROVED LEVELS? OSHA's permissible level is 50 parts per million parts of air for an eight-hour, time-weighted, average airborne concentration. Concentration above 500 parts per million for any length of time are considered to be imminent danger situations. Concentrations above 150 parts per million for a total of one hour or more are considered to be serious violations.

HOW IS IT MEASURED? The primary method is a carbon monoxide portable, Hopcalite-reagent type meter. The secondary method is certified detector tubes.

Silica

WHAT IS IT? Silica is an oxide of silicon and is the characteristic ingredient of a great variety of minerals, including quartz, cristobalite, tridymite, amethyst and sand.

WHERE IS IT? Silica is found throughout industry is various manufacturing processes, such as iron and mineral processing plants, mining, abrasive soap production, glass manufacturing, potteries, foundries, abrasives use and manufacturing, in stone cutting and finishing industries.

WHAT IS THE HAZARD? More than 1.1 million employees are exposed to the hazard created by inhalation of silica dust. Inhalation of these particles can produce rapidly-developing (acute) or chronic silocosis—a disabling lung disease. Typically, the lung tissue reacts to the presence of silica particles by forming fibrous matter around the particle. Evidence suggests that particles below one micron (one-millionth of a meter) in size may be the most dangerous since they may penetrate deeper into the lungs in high concentrations. In rapidly-developing silicosis, symptoms appear eight to 18 months after the first exposure. Chronic silicosis, the type usually encountered in industry, generally, is produced only after years of silica inhalation. The symptoms for either type are the same—slowly increasing difficulty in breathing under exertion.

HOW IS IT CONTROLLED? The best method is substitution of another material; for example, use of steel shot or alumina grit in place of sandblasting operations. Other methods include enclosure of operations, local exhaust ventilation, segregation of operations, wetting, and ordinary good-housekeeping practices.

WHAT ARE APPROVED LEVELS? For respirable quartz particles, OSHA's permissible level is 10 milligrams per cubic meter of air, divided by the percent of free silica plus 2.

For respirable cristobalite and tridymite, the limits are one-half the value of quartz. Imminent danger situations generally are not applicable. Any eight-hour, time-weighted average greater than four times the limit is considered a serious violation.

HOW IT IS MEASURED? Personal sampling pumps with filters are used to collect dust samples for worker exposure. The collected dust then is weighted for a given volume of air.

