# TOOL BOX TALKS
## How To Give A Tool Box Talk

Communication is one of the best ways to prevent accidents. And one of the best ways of communicating the importance of safety on a construction job is through toolbox talks. You don't have to be a professional speaker to give a good toolbox talk. But there are ways you can make your talks more effective. Let's take a look at them.

**The Agenda**

Know your topic and plan your agenda a few days before the meeting so you're well prepared. (Be able to present the talk without reading it and lead a discussion afterward.) Wherever possible use actual equipment to illustrate your points. Coordinate hand-out literature or other material you intend to use at the meeting.

Limit the length of your presentation. Given your operation, you would be the best judge of how much time to set aside. Generally speaking, a half-hour is adequate. Allow for questions and answers afterwards-about 15 minutes.

Use visual examples. There's something to be said for "Seeing is believing." ff you're talking about ladders, have one handy so that you can point out such things as loose rungs or split side rails. If you plan to talk about the danger of using patched up hand tools, show a few samples. Consider a chisel with a mushroomed head; a hammer with a taped handle.

Do a wrap-up. Reinforce the important points brought out during the meeting. Thank your staff for their interest and enthusiasm.

**The Format**

Staff the meeting out on a positive note. After welcoming your staff, promote team work and how toolbox meetings not only provide valuable information but give everyone the opportunity to get together and exchange ideas. Be sure to compliment a job well done. Morale plays a bigger part than people think in affecting productivity and job satisfaction.

Keep it informal. Even though you may be using this resource as well as others, use your own words in making the actual presentation. For effective and rewarding results, do what's comfortable for you.

Invite people to participate. The purpose of any toolbox talk is to get people to think about safety problems. Make the talk a hands-on session. Have your people name hazards and what to do about them. Encourage them to offer suggestions to improve safety. When asking questions, use open-ended questions instead of questions that require only a yes or no answer.

**The Topic**

Choose timely topics. Gear your talks to safety problems you are encountering at the moment or that you anticipate in upcoming jobs.

- Review recent injuries-
  - What happened?
  - Why did it happen?
  - What should have been done?

- Review recent safety violations-
  - What was the violation?
  - What hazard did it create?
  - What injury could have occurred?

- Review upcoming work schedule-
  - What hazards are you concerned about?
  - What safety equipment should be used?
  - What procedures should be followed?

**The Place and Time**

Hold the meeting in your work area. We recommend holding the meeting first thing in the morning or immediately after lunch when the workday will least be interrupted and the work area relatively quiet.

Hold a toolbox meeting once a week to reinforce your company" philosophy that job safety is important.

We hope our toolbox talks help you in the daily operations of your business. Keep them handy. Like any tool, they can" help unless you use them. If you have any questions, contact your EHS representative.

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## CBS *INJURY AND ILLNESS PREVENTION PROGRAM*

### Appendix G: EMPLOYEE SAFETY TRAINING

**Location:** _____

**Date:** _____

**Conducted By:** _____

**Topic:** _____

_____

_____

**Attendees:**

| Name (Print) | Signature |
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# HAZARD COMMUNICATION

## *Protecting Your Health and Safety*

Hazard Communication, or "HazCom," is the best way for you to find out about the danger of exposure to chemicals in your workplace. It lets you know how to protect yourself and others from these hazards.

### We Need HazCom

Your health and safety, and your coworkers', depends on your understanding of the information your employer provides about handling chemicals. HazCom can help you prevent disabling injuries, serious illness, even death due to explosions, fires, other accidents, or overexposure to chemicals.

If you don't work in a chemical or manufacturing company, you may think that you are not at risk. But, your exposure to chemicals such as cleaning solvents, pesticides, gasoline, even toner in your office copier can be harmful if the chemicals are mishandled.

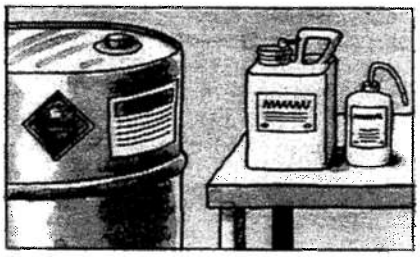
Attention to your company's HazCom program is always important. A manufacturer may change the formula of a chemical you've used before, or you may start working with a new chemical.

### The HazCom Standard

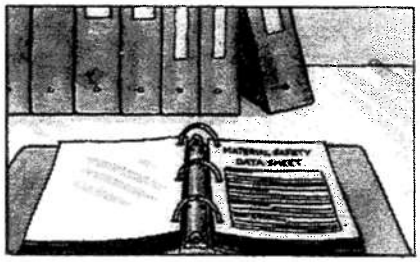
The Occupational Safety and Health Administration (OSHA) established the HazCom Standard to protect the health and safety of employees. The HazCom Standard ensures your right to know about potential dangers by requiring employers to develop and explain the company's written HazCom program.

### Three Important Aspects

The most important elements of any company's HazCom program are:



❶ Warning labels on containers



❷ Material Safety Data Sheets (MSDS)


❸ Employee training on the proper handling, usage, storage,and transportation of chemicals.

### Your Company's Program

Your supervisor, or the company's HazCom contact, can give you details on your company's program. Each company's approach is different, but most programs let you know such things as:

- When and how your next training will take place;
- What MSDSs tell you and where they are located;
- The names of hazardous chemicals in each work area;
- How to obtain a written copy of your company's own HazCom Program and of the official OSHA HazCom Standard;
- How site evaluations will be performed;
- Which protective measures and equipment are required or suggested for each chemical;
- How outside contractors will be trained;
- Special procedures for occasional hazards and unlabeled pipes;
- Results of chemical manufacturers' reviews of scientific studies on each chemical.

### Partners in Protection

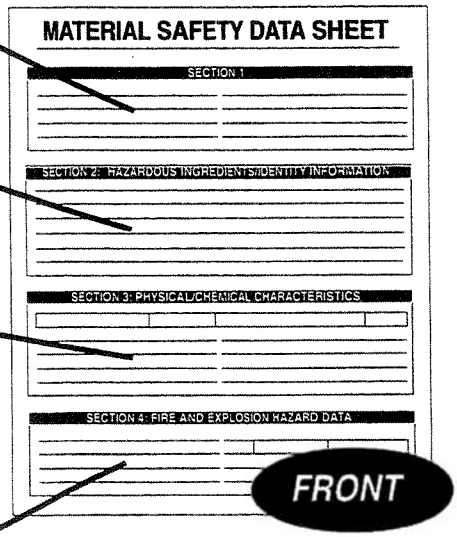
You and your employer are partners in protecting you against chemical hazards. Your responsibilities begin with reading carefully the important information on all labels, MSDSs, and training materials which your employer gives you. If you don't understand something, ask your supervisor to explain it.

Your health and safety in the future may depend on your following the correct procedure now.

# READING MATERIAL SAFETY DATA SHEETS

*Effective Protection You Can Depend On*

The Material Safety Data Sheet, or MSDS, is written information that can help you handle HazMat shipments safely. Know where you can find a MSDS to familiarize yourself with the chemicals in a HazMat shipment. Each company can design its own MSDS form, and the sections may be in different order. But they must be readily accessible and include some basic information.




## HazMat Chemical Name

Lists the identity of the commodity (the name on the label), date the MSDS was prepared, the name and address of the manufacturer, and usually a phone number for emergencies and more information.

## Hazardous Ingredients/Chemical Identity

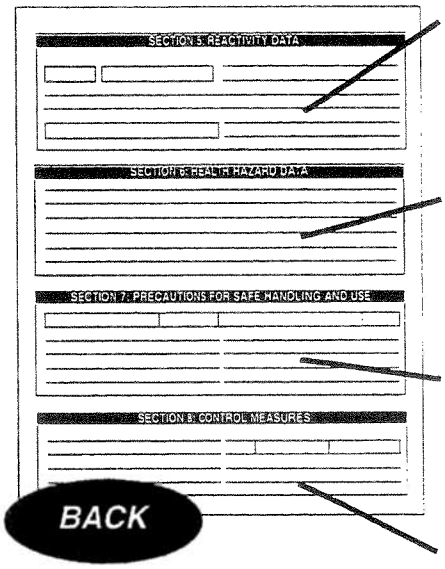
Includes names of substances in the material that might be dangerous, and safe exposure limits such as Permissible Exposure Limit or PEL (set by OSHA) or the Threshold Value Limit or TVL. Also lists common names for the chemical.

## Physical Characteristics

Describes many physical qualities of the commodity, and lets you know what's usual or safe. For example, how it looks and smells; boiling and melting temperatures (important in case it can become a gas you could breathe); evaporation rate (known as percent volatile); how easily it dissolves; and how heavy it is (this tells you if it will sink, float or dissolve in water.)

## Fire and Explosion Data

Tells you the lowest temperature when the commodity could catch fire ("flash point"). Lets you know if it's flammable (catches fire below 100°F) or combustible (catches fire above 100°F). Lists the best way to put out a fire involving the material.




## Reactivity

Describes what happens if the material comes in contact with air, water, or other chemicals. Describes conditions (like heat) or materials (like water) that can cause reactions such as burning, exploding or releasing dangerous vapors. The material is called "incompatible" or "unstable" with these conditions or substances.

## Health Hazards

Lists ways the material might enter your body, like splashing on your skin or being breathed in as vapor as well as possible symptoms of overexposure. Lets you know if overexposure might make existing medical conditions worse, and describes emergency first aid procedures.

## Usage, Handling And Storage

Describes how to clean up an accidental spill, leak or release, including special procedures. Tells you how to handle, store and dispose of hazardous materials safely. Remember, if there is an accident, notify your supervisor immediately, and take care of it yourself only if you are trained to do so and are wearing the proper equipment.

## Special Protection And Precautions

Explains special Personal Protective Equipment (PPE) and other equipment to use when working with the material, special procedures, extra health or safety information, signs that should be posted and other information not covered in other sections.

# UNDERSTANDING HAZMAT WARNING LABELS

Hazardous materials warning labels are affixed to packages containing hazardous materials. They have been designated and color-coded for quick and easy recognition of the hazards present. The shipper is responsible for labeling HazMat shipments, but drivers should be certain that hazardous materials labels are affixed to packages requiring them before accepting a shipment.

## Label Specifications

The regulations require that hazardous materials warning labels meet minimum specifications, including:

- Labels must be durable and weather resistant.
- Each 4-inch by 4-inch diamond-shaped label must have a black solid-line border 1/4 inch from the edge on all sides.
- The specified color for each label must be extended to the edge of the label as prescribed.

- Labels may contain the United Nations hazard class number.
- Labels affixed to import shipments in other countries may contain inscriptions required by the country of origin.

## Labeling Mixed And Consolidated Packages

If a material has more than one hazard classification and one is Class 1 (explosives), Class 2 Division 2.3 (poison gases), Class 6 Division 6.1 (poisons) or radioactive materials, its package must be labeled for each hazard.

Packages must be labeled for each hazard when hazardous materials of different classes are packed within the same packaging.

## Label Placement

A label must not be obscured by markings or attachments.

Each label must be affixed to a background of contrasting color or have a solid or dotted line outer border.

When two or more labels are required, they must be displayed or affixed next to each other.

When possible, labels must be printed on or affixed to the surface of the package near the marked proper shipping name.

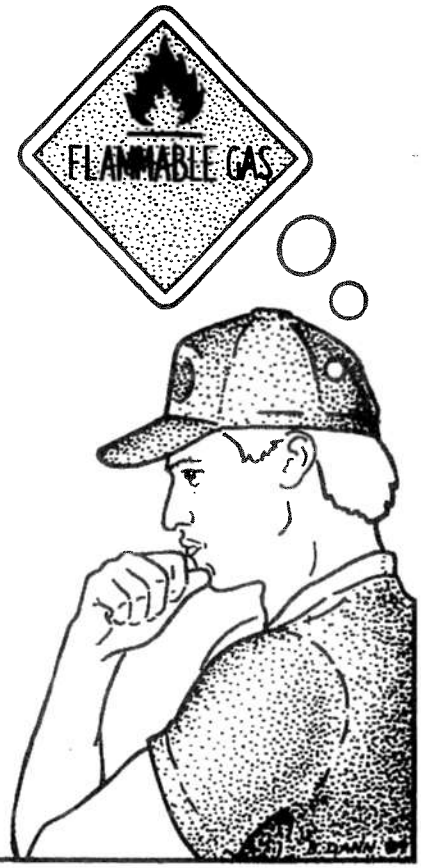
Packages of dimensions smaller than the required label that contain no radioactive material, compressed gas cylinders, and other packages with irregular surfaces may affix a label to a tag that is securely fastened to the package.

Radioactive materials requiring labeling must be labeled on two opposite sides of the package.

Labels must not be applied to a package that does not contain material subject to DOT labeling requirements.

## Look For The Label

Look for HazMat warning labels when you pick up a shipment. They are required by the DOT and offer you vital information about any dangers associated with your cargo.



# Pay Attention to Chemical Warning Labels

Warning labels, found on all containers of hazardous chemicals in the workplace, provide much of the information you need to know to use hazardous chemicals safely. Understanding warning labels will help you handle and use these chemicals properly and avoid health and safety problems in the workplace.

## What's on a Warning Label

All warning labels show the name of the chemical; the name, address and phone number of the manufacturer or importer; and the chemical code number. All warning labels will contain one of three signal words that indicate just how dangerous the chemical is. *Warning* indicates a greater hazard than *Caution* does, while *Danger* indicates the highest level of hazard. Highly toxic chemicals will be labeled *Poison.*

The label will also contain information about physical hazards—if the chemical is flammable, explosive, corrosive and so forth. Health hazard information will list such dangers as eye, lung and skin irritation, burns or systemic illnesses.

## Other Information

Warning labels may also tell you how to store and dispose of the chemical properly: the type of container needed, how to dispose of chemicals and containers. The label may indicate precautions to take, such as how to clean up, what personal protection equipment to use with the chemical, and how to handle leaks or spills. First-aid instructions may include antidotes for poisons and what steps to take when someone is exposed to the chemical.

## Make Sure It's Labeled

Making certain that hazardous materials are properly labeled is a responsibility that all employees must share. Labels are required on all stationary containers. If you find a container with no label or with a torn or illegible label, report it to your supervisor immediately. Don't attempt to use or handle the chemical until you know for sure what it is. If you're carrying hazardous chemicals in a portable container that someone else might use, you should label the container to ensure the safety of other workers.


**Always read the label whenever you use any hazardous chemical.**

## Read the Label—Each Time

When health and safety are at stake, it pays to double-check. Always read the label whenever you use any hazardous chemical. Although you may have used the same chemical many times, the manufacturer may have changed the formula, or provided the wrong concentration. Avoid identifying chemicals by the label's color or design alone. If the label raises any questions in your mind about the appropriateness of your environment and protective equipment to deal with the hazardous chemical, check company policy or consult your supervisor before using the chemical. Taking responsibility for knowing the contents of chemical containers protects not only you, but also every other employee at your place of work.

CHEMICAL
SAFETY

# Chemical Spills and Leaks

## *Do You Know What to Do?*

There is much that you can do to prevent a spill or leak, but if one occurs, your safety and that of others depend on your quick and appropriate response.

### Prevention

Since the best spill is no spill at all, follow these procedures to lessen the chance of one occurring:

- Inspect containers regularly for leaks, corrosion, worn seals.
- Handle containers with care, removing only as much of their contents as you need at a time. Close containers after using them.
- Find out how to dispose of chemicals you no longer need.

### Getting Ready

"Getting ready" for a spill? Yes—unfortunately spills do happen, and there are certain preparations you should make:

- Be familiar with your company's emergency response plan, evacuation routes for your area and your assigned role in a spill situation.
- Make sure that the phone number of the emergency coordinator to whom you must report a spill is clearly posted.
- Check labels and MSDSs of chemicals you use. You should know the potential hazards—fire, explosion, reactivity, toxicity—that might be present in a spill.

### When a Spill Happens

If a spill occurs, try to avoid touching it, walking in it, or breathing it, whether it has an odor or not. *Report a spill or leak immediately.* Be prepared to tell what is leaking or spilled, where it is, the size of the spill or the leak's rate of flow. You may be asked to clean up a small spill, following company policy and MSDS procedures. For larger spills, your response depends on your assigned responsibility. Unless you are on the spill response team, you should evacuate the area according to your assigned route, warn others to leave and stay out of the area until you are told it's safe to return.

### Containing the Spill

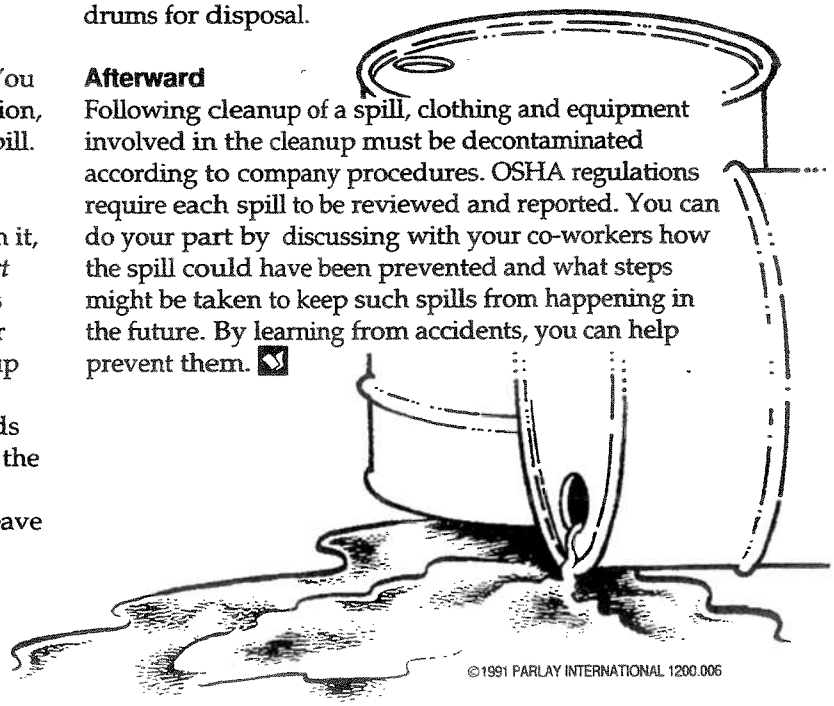
For all but the smallest spills, the spill response team will step in with procedures and equipment for containing the spill and protecting workers and the environment from exposure to the substance. Team members must wear protective clothing and perhaps respirators. If the spill is flammable, they will avoid using tools that spark. Corrosion-resistant tools must be used with corrosive substances.

The first step is to try to stop the leak or spill by securing a valve, closing a pump, plugging a hole in a leaking container or shifting a container to stop the flow. A barrel may be placed under the leak, or the leaking container may be placed in a larger container or a bag.

Meanwhile, team members work to keep the spill from spreading, putting dikes around drains or reactive chemicals. Once the spill is under control, workers can use a variety of cleanup methods. Absorbent pillows, pads or substances such as clay and vermiculite absorb small spills. Workers may use a vacuum truck or a specially designed squeegee to move the spill to a chemical drain or to special drums for disposal.

### Afterward

Following cleanup of a spill, clothing and equipment involved in the cleanup must be decontaminated according to company procedures. OSHA regulations require each spill to be reviewed and reported. You can do your part by discussing with your co-workers how the spill could have been prevented and what steps might be taken to keep such spills from happening in the future. By learning from accidents, you can help prevent them.



# Flammable Liquids: The Unseen Hazard

We call them flammable liquids, but it's not the liquid that we need to worry about. It's the vapor that these liquids give off. This vapor and the air in a room form a mixture that is poised to explode at the first spark from a light switch, faulty electrical equipment, or static electricity. Even high temperatures or simple friction can set off an explosion. And flammable vapors are especially dangerous because you can't see them, and often you can't smell them.

What are some flammable liquids you use on the job? Solvents, cleaning fluids, and fuels are a few that come to mind. There are three keys to safety with flammable liquids: keep the lid on, use adequate ventilation, and avoid ignition sources.

Keeping the lid on is a matter of good housekeeping. Keep flammable liquid containers tightly covered and store them away from other chemicals in well ventilated, temperature-controlled areas. Dispose of flammable soaked rags and other waste materials in tightly closed, designated containers only. Avoid spilling the stuff on yourself. Check with your supervisor about how to get rid of used flammable liquids. Pouring them down drains simply creates an explosion hazard in pipes and sewers.

Each flammable liquid reaches a peak of explosiveness when enough of it mixes with the oxygen in the air. Prevent buildup of vapors to this level by using flammables only where there is enough ventilation to clear the vapors out. Areas


below where you are working should be either sealed off or ventilated as well. Since flammable vapor is heavier than air, you could think of it as an unseen river, flowing downward from wherever you use it, filling excavations, sewers, and pipes, until it meets a spark or flame. If someone is using flammables at the second level of a building, and someone below decides to take a cigarette break—watch out! The vapors could ignite, flashing back to the worker upstairs.

Keep flammables away from areas where there are welding, grinding, or cutting operations; smoking areas; or areas of faulty wiring. Where there is heavy use of flammables, special sparkproof light switches and fixtures should be installed. Before transferring flammables from a drum to another container, connect the drum to the container with a bonding wire. Just the friction of pouring can create enough static electricity to cause a spark. Use fireproof safety containers with vapor screens and vaportight caps.

One flammable vapor hazard deserves special mention: empty drums that have contained flammable liquids. When these drums are full, there is not enough oxygen inside them to allow an explosion. But just a few drops of flammable liquid in a closed drum are all that it takes to create an explosive mixture with the air in the drum. Never do any welding or repair work on such a drum without getting clearance first.

Treat flammable liquids with respect. Their vapors can lie low and travel fast and far without your knowing it. They deserve to be called "the unseen hazard."

# Staying on the Safe Side of Corrosives

Corrosives are substances that can burn or destroy on contact. There are two types of corrosives: acids and bases (or alkalies). The warning label on all corrosives tells you how to protect yourself.

## DANGER! Causes severe burns to skin and eye.

Corrosives react with other substances to eat away or chemically burn whatever they touch. They can burn skin, irritating or even blistering it and can severely damage eyesight. The extent of a corrosive burn depends on the concentration of the corrosive and how long it stays on your skin. This is why you should treat a corrosive spill as a chemical burn emergency: Immediately flush the affected area with water for 20 minutes, and get medical attention.


## Do not get in eye, on skin, on clothing.

The right protective equipment is your guarantee against skin or eye contact with a corrosive. Workers who deal with corrosives need to wear goggles or safety glasses and, in many cases, a face shield for full protection against splashes. Wear clothing and gloves made of neoprene or other chemical-resistant material. Work with some corrosives requires you to wear a fully encapsulated suit and chemical-resistant boots. Check your protective clothing each time you put it on for rips or worn areas.

## Avoid breathing any mist or gas from this material.

Wear an approved respirator equipped with the right cartridge or canister for the corrosive you are using. Inhaled corrosive gases can cause irritation of the mouth and respiratory passages, coughing, difficulty breathing or respiratory failure. If you inhale corrosive gas, move into fresh air immediately and get medical attention to make sure there is no internal damage.

## Keep this container closed when not in use.

This warning points to the dangers of corrosives in the environment. Some corrosives produce toxic or explosive gases. Acids and bases react violently with water and with each other; they are flammable or contribute to the fire hazard of other substances. Make sure all containers, including temporary containers that others may use, are clearly labeled and in good condition, with no cracks, leaks or dents. Store containers according to approved guidelines; keep acids, bases and corrosives separate from one another or other substances. When mixing a corrosive with water, always add the corrosive to the water; adding water to concentrated acid may produce a violent reaction. Avoid pouring corrosives into the drain; dispose of them according to company policy. Clean up small spills immediately, but if there is a large spill, evacuate the area at once and report the spill. Leave cleanup to a trained and equipped cleanup crew.

## Make sure there is adequate ventilation.

When acids react with metal, they produce explosive hydrogen gas. Some corrosives release oxygen, which poses a fire hazard. And many corrosives are flammable in themselves. Safe handling, along with adequate ventilation, minimizes the risk of an accident involving fire, as well as accidental inhalation.

## Always wash after handling this material.

Being a safety-conscious worker, you didn't spill any of the chemical on your clothes or in your work area. But can you be sure? A spill on gloves or equipment may not be noticed until later, when you accidentally touch the contaminated material. Washing is your guarantee against contamination. Begin by thoroughly washing your gloves. (If a corrosive splashes on your protective clothing, carefully follow company policy for removing the contaminated clothing.) Keep your street clothing separate from your work clothes. Make sure you leave your work area and equipment clean.

Because corrosives are used in many industrial applications, you may find that you work with several of them. Read the MSDS accompanying each one, to learn what special dangers it poses in addition to being corrosive. Then take steps to protect yourself and your environment from those dangers.

# Staying on the Safe Side of Compressed Gases

Any material that is under pressure can be dangerous if it is not handled properly. If the material is a compressed gas it may be flammable, explosive, reactive, toxic or a combination of these. Because of the hazards of compressed gases, it's important to know what you're working with, what its hazardous properties are and how to safely handle its container—the compressed-gas cylinder.

### Identify It Positively

Before handling any compressed-gas cylinder, identify it by its identification and hazard labels, not its color. (Different manufacturers use different color codes.) Check the label for hazards, and read MSDS instructions on handling and protective equipment. Each cylinder should be labeled for maximum approved pressure, with a current test date on the label. Cylinders missing this information should not be handled.

### Handling Cylinders

Only trained persons should unload cylinders. Before accepting cylinders, inspect them for damage or leaks. Inspect them at regular intervals and move damaged or leaking cylinders to a safe, isolated storage area—a ruptured cylinder can literally become a rocket with the force to blast through a concrete wall. When moving cylinders, use special cylinder hand trucks, with the cylinder lashed to the cradle and standing as upright as possible. Avoid dropping, banging or rolling cylinders. Keep them away from fire, heat and sparks.

When using cylinders, open the valve slowly, with the cylinder pointed away from people. Make sure the hoses and connections are clean and in good condition each time you use the cylinder. When cylinders are not in use, screw down the protective metal cap to the last thread. Empty cylinders should be labeled "MT" and kept separate from full ones.

### Safe Storage

Compressed-gas cylinders should not be stored in temperatures above 125°F(51.7°C), in direct sunlight, or subjected to artificially created low temperatures. Keep cylinders upright, secured with a chain or cable, in a safe, fire-resistant, well-ventilated area, away from heat sources, combustible materials and electrical wiring. Group cylinders with others of the same contents, and store empty cylinders separately. Make sure all stored cylinders are clearly labeled, and check them regularly for leaks. Rotate stock, using older cylinders first. Keep oxygen cylinders at least 20 feet away from flammable gas containers and combustible materials, oil and grease. Avoid using cylinders in confined spaces.

### Special Handling

The following compressed gases require special treatment:

- Oxygen: While not flammable in itself, oxygen increases the tendency of things around it to burn or explode. Keep oxygen cylinders away from combustible or flammable materials and fire hazards, including oil or grease on your hands, clothes and work area. Oxygen should not be used in place of compressed air.
- Chlorine and fluorine: These gases are highly corrosive and irritating, and will attack many materials. When mixed with acetylene and exposed to light, they may explode. Chlorine will form corrosive hydrochloric acid in water, eating into iron or steel equipment. A gas mask and other protective equipment should be available for use in case of a leak.
- Ammonia: This is a highly corrosive gas. When using it, make sure you have quick access to a gas mask and other protective equipment.
- Acetylene and hydrogen: These are both highly explosive gases that must be handled with extreme caution. Hydrogen escapes easily from threaded fittings that are not completely tight, and such leaks can ignite spontaneously from the friction of the escaping gas. Hydrogen has no odor to warn of a leak.

### Accidents

Compressed-gas accidents include accidental release of toxic gases, explosion and cylinder rupture. Learn your company's emergency response plan for each emergency situation now, so you will know what to do in case one happens. And do your best to prevent such accidents by knowing the gases you work with and their hazards.

# Staying on the Safe Side of Oxidizers

Oxidizers are chemicals that release large amounts of oxygen into the air. If you work with oxidizers, you know that they are a dangerous and unpredictable group of chemicals. Knowing what makes oxidizers dangerous can help you guard against accidents involving them.

### Oxidizers Are "Firebugs"

When a fire burns, it needs oxygen to maintain the reaction that feeds the fire; that's why using a bellows makes a fire burn hotter, and why smothering a fire makes it go out. Oxidizers are like chemical bellows: They provide plenty of oxygen to make a fire bigger and hotter. Inorganic oxidizers can increase the danger of fire around flammable or combustible materials, while organic oxidizers are flammable in themselves. Some organic oxidizers can even explode when they are exposed to heat, shock or friction. Oxidizers can supply oxygen to a fire and support combustion even if there is no oxygen present in the air. Commonly used oxidizers are concentrated nitric acid, compressed oxygen and hydrogen peroxide.

### Keep Them Separate

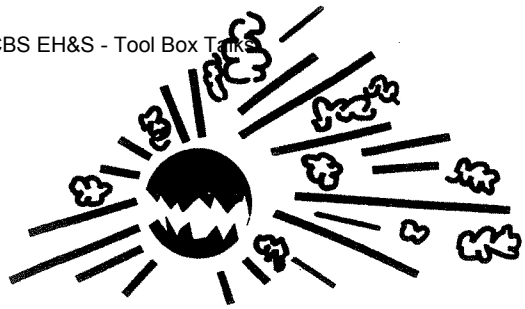
Because oxidizers are "firebugs," they must be kept away from flammable liquids and from wood, paper and other easy-to-burn materials. Always keep containers of oxidizers tightly closed, and store oxidizers in isolation; even different types of oxidizer should be stored separately. Check containers for leaks, and be sure to use the right container, since some oxidizers can damage seals and valves. Large amounts of them should be stored in a separate room with specific fire-protection requirements. Make sure all containers are clearly labeled; report containers with missing or illegible labels.

### In an Emergency

If you spill a small amount of oxidizer in a well-ventilated area, wipe it up immediately, disposing of cleanup materials in an approved manner. Large spills pose an immediate fire hazard; you should evacuate the area and report the spill at once. Leave the cleanup to an emergency response team that has the equipment and tools designed to protect them and prevent accidental fires.

### Using Oxidizers

Because oxidizers are a fire hazard, be sure you are familiar with fire response procedures and the location of fire extinguishers. Before using an oxidizer, read its MSDS to become familiar with the hazards it presents. Is it flammable or explosive? Is it dangerous when mixed with certain other chemicals? In what kind of temporary container can you safely store it? Is it corrosive or dangerous to inhale? How do you handle a spill or accidental contact with it? Most oxidizers are also corrosive and can irritate skin or lungs. Take appropriate precautions, such as wearing personal protective equipment or working under a hood. By knowing its properties, you can more safely use the oxidizer and prevent accidents.



# Staying on the Safe Side of Explosives

If your company uses explosives, reactive or unstable chemicals, or pressure vessels, the risk of explosion exists. By understanding what materials could explode and the factors that trigger an explosion, you can help prevent this most dangerous of workplace emergencies.

## Explosive Materials

Explosives can be classified into three categories according to level of hazard. Class A explosives, the most powerful, include dynamite and nitroglycerin. Class B explosives, including such products as propellants and photographic flash powders, are not as powerful as Class A explosives, but are still very dangerous, especially in confined spaces. Class C explosives are often manufactured materials that contain small amounts of Class A or B explosives, such as some fireworks.

If your workplace doesn't use any of these explosives, read on anyway. The majority of explosive hazards found in the workplace involve chemicals that are not classed as explosives but can be explosive under certain circumstances. The following materials and situations can be dangerous:

- Explosive vapors, which can be ignited by a spark, friction or heat.
- Flammable vapors in confined areas.
- Reactive chemicals such as oxidizers, which can ignite when mixed with or stored near certain other chemicals, or which explode when exposed to air or water.
- Pressure vessels such as compressed-gas cylinders or steam boilers, when there is a rupture or valve failure.
- Some chemicals undergo changes as they get old, making them increasingly unstable.

## Know the Hazards

Since explosions can occur under many different circumstances, it is important to know about the chemicals you work with. Read the MSDS for the chemicals you use, and be sure you understand the flash point and upper and lower explosion limits for volatile chemicals. If necessary, ask your supervisor to explain these numbers. They tell you what ranges of temperature and concentration are safe to work with. Learn what substances are incompatible with each chemical, and whether the chemical may be safely exposed to air, water or combustible materials.

## Safe Storage

In the U.S., each state regulates how explosives are stored. As a general rule, explosives are stored in areas called "magazines," and posted with signs reading "Explosives—Keep Off." Keep explosive storage areas clean and dry and accessible to emergency equipment. Store packages of explosives flat, following "This Side Up" directions, and rotate stock, using the oldest first. A permit is usually required to store black powder, which should be kept separate from other explosives. Avoid smoking, lighting matches or using spark-producing tools near explosives or within 50 feet of an explosives magazine. Follow MSDS guidelines when storing incompatible or flammable chemicals. Unstable chemicals and explosives that have exceeded their expiration date should be disposed of, but only by professionals trained to handle them.

## If There's an Explosion

Clearly, when an explosion occurs, you must evacuate quickly, and report the explosion and its circumstances to your emergency response coordinator. Then stay upwind of the explosion. But the time to prepare for an explosion is **now**. Be sure you know your company's emergency procedures and evacuation routes, so you will be ready for the unexpected. You won't have time to look up this information during an explosion!

## Be Alert

When working with explosives or unstable chemicals, follow the same precautions that you do for storage and handling:

- Avoid exposing explosive chemicals to incompatible substances, heat or ignition sources such as matches, cigarettes, sparking tools or friction.
- Be especially cautious when working in confined spaces.
- Treat any buildup of heat in the container or surrounding air as a danger signal.
- Report any defects or damage in containers.

Your alertness and familiarity with the hazards of explosives are the way to prevent explosion.

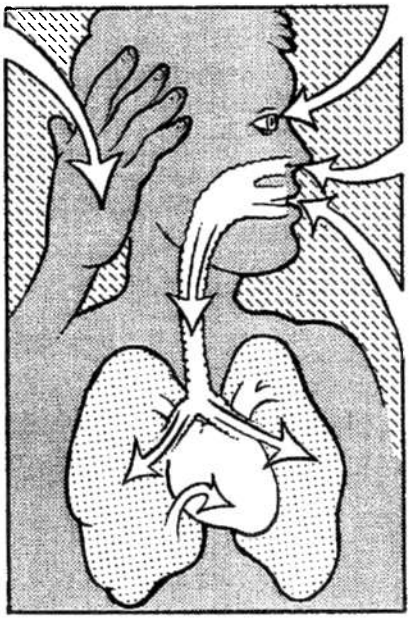
CHEMICAL SAFETY

# The ABCs of Chemical Exposure

When working with hazardous chemicals is part of your job, it is important for you to know the risks you face with each chemical you use. This guide will outline the kinds of injuries that chemicals can cause, types of chemical exposures and their effects, and factors that influence the severity of exposure.

### Exposure—How Much, How Often and How Long?

Chemicals greatly vary in their toxicity, but three factors—the amount, the frequency and the duration of exposure—must always be considered. Acutely toxic chemicals can injure after a single exposure, while other chemicals cause harm after repeated exposures. Being aware of which chemicals are toxic only when exposure is repeated or prolonged can help you protect yourself from this dangerous group of substances that injure without obvious or immediate symptoms.



**Chemicals enter blood through the skin, eyes, mouth or, most frequently, the lungs.**

### Physical Characteristics Determine Exposure Level

Extremely volatile chemicals evaporate readily and thus contaminate the air you breathe more easily than other chemicals do. If flammable they are an extreme fire or explosion hazard as well. Corrosive or highly reactive chemicals are acutely toxic and will injure skin, respiratory passages or eyes immediately on contact. Consult your MSDS for information on the physical characteristics of chemicals you use.

### Routes of Entry

How a chemical gets into your body influences its toxicity. Your skin protects against some chemicals that are toxic only if you inhale them, while others are deadly only if swallowed. Still other chemicals can be handled safely but will injure eyes on contact. Know which routes of entry—skin, mouth, lungs, eyes—are dangerous for the chemical you use, and always use protective equipment to prevent those kinds of exposures.

### Kinds of Reactions

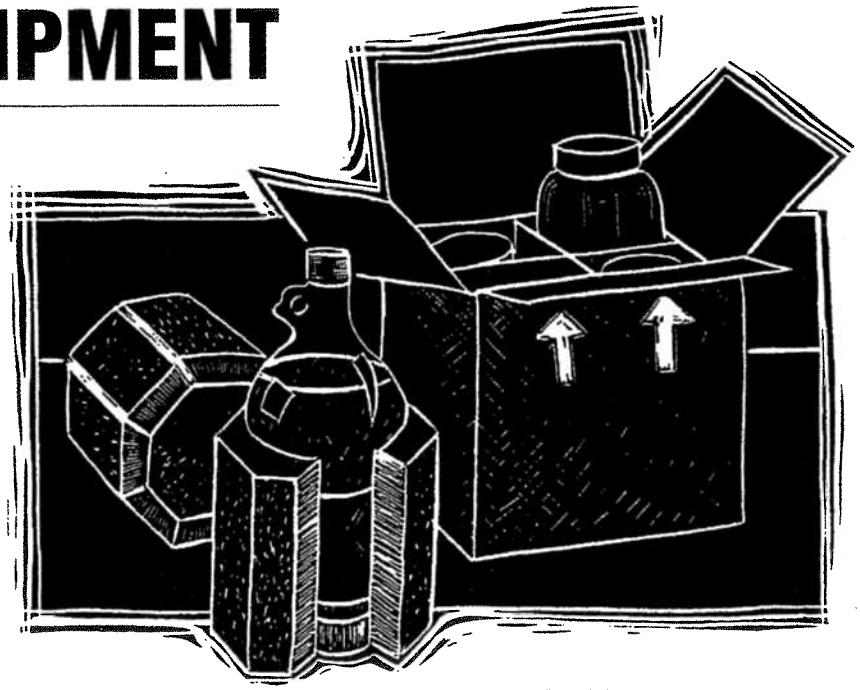
If you are exposed to a hazardous chemical, you can expect one of two kinds of reactions: local or systemic reactions. Local reactions occur at the place where the exposure occurred—for example, skin, eyes or lungs—and may range from minor irritation to severe tissue damage. Breathing dangerous chemical vapors may injure lungs and respiratory passages, while swallowing such chemicals can damage your mouth, esophagus, stomach and intestines. Although most local reactions are immediate, some, such as allergic rashes, occur only after repeated exposure and may vary from one person to another.

When chemicals enter the blood through the skin, eyes, mouth or, most frequently, the lungs, certain organs (called "target organs") or your entire body can be damaged; this is a systemic reaction. Systemic reactions can be immediate but often are delayed: You don't know they are happening until they have done severe damage.

### Do Your Homework

To protect yourself from unexpected injury from a hazardous chemical, refer to the MSDS for that chemical. It will list the signs and symptoms of chemical toxicity for both local and systemic reactions as well as the target organs and primary routes of entry. Always use personal protective equipment and follow safety guidelines appropriate for the chemical. And avoid relying on your memory or tips from co-workers: Review the MSDS whenever you have the slightest doubt about the hazards of any chemical.

# PACKAGING YOUR HAZMAT SHIPMENT



Packaging hazardous materials properly is crucial to ensure safety during transport. The shipper is responsible for determining that a hazardous material is packaged properly, but drivers also should check HazMat packaging to prevent spills, leaks or delays in transit.

## What's In The Regs

The regulations outline standard guidelines for all containers authorized to hold hazardous materials. In addition, there are general packaging guidelines for each DOT hazard class and specific packaging requirements for commodities within each hazard class. Use the most precise packaging information available to determine the container for your HazMat shipment.

## How To Find The Right Container

To determine the right container for a shipment of hazardous materials, you must refer to the Hazardous Materials Table. The table will direct you to the regulations outlining packaging requirements and exceptions for that hazardous material.

If there are no detailed DOT packaging specifications for your hazardous material, follow the standard requirements for all packages.

If the proper chemical name is not listed, refer to the "not otherwise specified" (n.o.s.) or general packaging guidelines for that hazard class.

## Standard Requirements For HazMat Packaging

Pack hazardous materials securely in strong, tight packaging.

Cushion inside containers to prevent breakage or spillage.

Packing materials and containers must be compatible.

Be sure nails, staples and other metal objects do not protrude into the container.

Use packaging thick enough so any friction caused by transport will not generate heat.

Select packaging that, under normal conditions:

- will not allow significant releases;
- will not become less effective; and
- will not allow a mixture of gases or vapors within the package.

When quantity limitations are not specified in the regulations, the permitted gross weight or capacity indicated by the container manufacturer is followed.

## DOT Marking Requirements

The Department of Transportation includes strict container specifications in the HazMat packaging regulations. All DOT-specification containers must have:

- the DOT specification marker;
- the maximum weight the package was constructed to handle; and
- the manufacturer's name or symbol.

Packaging not manufactured according to DOT specifications must not be marked as DOT specified.

## Packaging Secures Cargo

To ensure safety and security in transit, hazardous materials shipments must be packaged and prepared according to specific regulations. In general, HazMat shipments should be securely packed in strong, tight packaging with cushioning to prevent breakage.

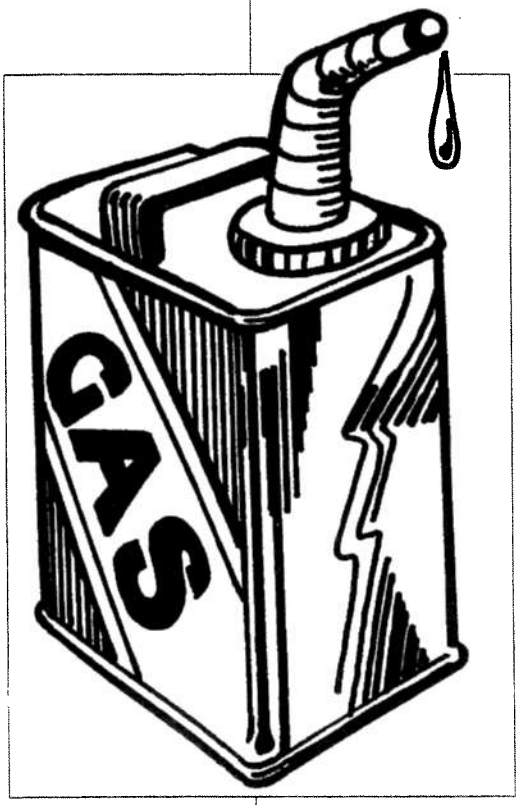
*Packaging requirements and container specifications are in Parts 170-179 of Title 49 of the Code of Federal Regulations.*

TOOLBOX TALKS

# Fill 'er Up—Safely!

We wouldn't need this talk if we could simply drive the crane or haul the compressor to the corner gas station every time it needed fuel. But on a construction site, nine times out of ten it's not practical to bring the equipment to the fueling site. So you bring the fuel—gasoline—to the equipment. Since gasoline is specially manufactured to be one of the most explosive of all flammable liquids—that's how it works in the engine—we need to take special precautions in transporting and using it.

Whether you are fueling fixed, semi-portable or self-propelled machines, the rules are the same: fuel while the engine is cold, shut off the engine, wipe up spills immediately, and no smoking. Fueling should be done in well ventilated areas, away from flammable surroundings or ignition sources such as sparks, heat, static electricity, faulty wiring—the same sources we stay away from when using any flammable liquid.




When large quantities of fuel are needed, self-propelled tank vehicles are the safest way to transport fuel.

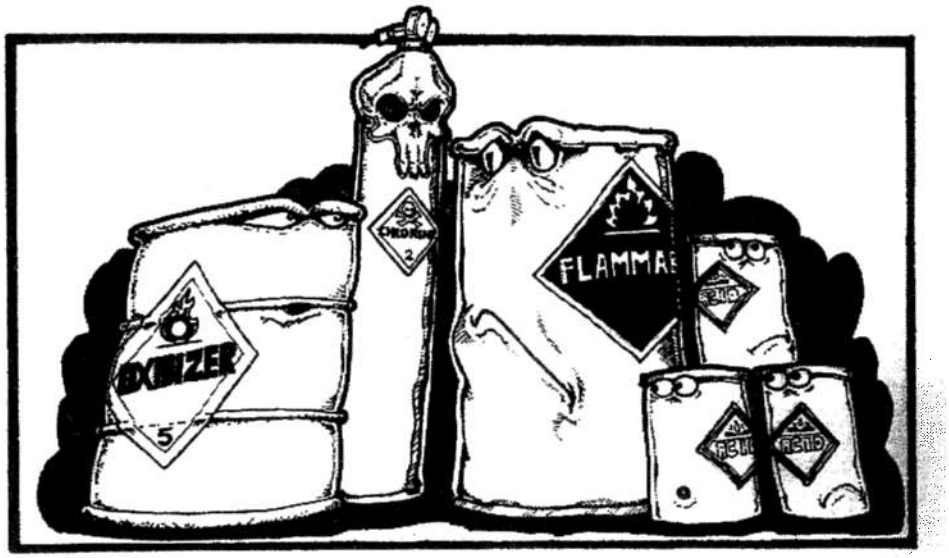
Portable tanks with hand-operated pumps can be used in some cases, if the terrain permits. These tanks should be positioned on stable ground and blocked and protected from rolling when fueling. They don't need to be bonded or grounded if the metal nozzle is in contact with the fuel tank being filled. Take special care to avoid spilling. Drain the hose after fueling so fuel won't be spilled in the next fueling operation. Never position the fueling tank so that the gas must travel through more than 15 feet of unsupported hose, or where the hose must be pulled tight to reach the tank being filled. When they're not in use, park portable tanks out of the way of moving equipment, with wheels blocked if the ground is not level.

For smaller fueling operations, where fuel is in a hand-carried portable container, be sure the container has a sturdy carrying handle with a flexible metal spout small enough to fit in the tank opening. The tank should be designed for this use and clearly labeled.

The most important thing to remember in fueling operations is to keep the explosion inside the engine where it belongs. To sum up: always shut off the engine and other nearby engines while fueling, fuel cold engines only, wipe up spills immediately, and stay away from ignition sources.

# Irreconcilable Differences

## *Storing Incompatible Chemicals*




If you store or move containers of hazardous chemicals in your job, you need to be aware of the dangers of incompatible chemicals—those chemicals that can react together to create toxic smoke, gas, heat, fire or explosion. Each of the following groups of chemicals is incompatible with other chemicals used in industry.

### Oxidizers And Flammables

Fires need oxygen to burn; that's why blowing air on a fire will make it burn hotter and why smothering a fire will put it out. Because oxidizers are chemicals that give off a great deal of oxygen in a hurry, you must take special precautions to keep them away from flammable and combustible materials. Inorganic oxidizers, the most common oxidizers used in industry, don't burn themselves but add oxygen to a fire and are especially dangerous near organic materials. Organic oxidizers not only feed a fire, but are also flammable; some can even explode as a result of heat, shock or friction. Storage areas should clearly label oxidizers, indicating the type and degree of hazard. Never store oxidizers with combustible materials or other oxidizers, and store large quantities of oxidizers in a separate room that is fire-protected. Store flammable liquids in a separate, ventilated room, in fire-resistant containers that have been grounded to prevent ignition from static electricity.

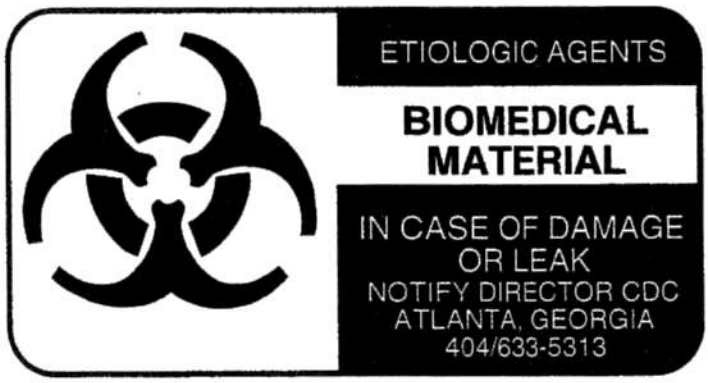
### Acids and Bases

Acids and bases are chemical opposites that react violently with each other, often producing heat, explosions or toxic gases. Since they are powerful corrosives, they can react with many other substances. Many acids are also oxidizers and can create fires if they react with combustible materials. Bases such as lye produce intense heat when in contact with water. (Chemicals whose names include the word hydroxide are usually bases.) Store acids and bases in separate areas in clearly labeled containers. Consult MSDSs for additional incompatibility data on these chemicals.

### Be Informed

When making decisions about storing chemicals, follow your company's chemical storage plan or refer to label warnings and MSDS information on compatibility. Don't assume that a chemical is safe because it doesn't seem to be an oxidizer or a flammable or an acid or a base. Store chemicals in their appropriate containers, under proper conditions. Only then can you be confident that you have stored a chemical correctly.

# *If You Have An Accident*




# INFECTIOUS SUBSTANCES

Every day trucks haul infectious substances, or etiologic agents, to factories, hospitals and offices. Because these shipments have become so common, it is easy to forget that they present very real dangers—and that accidents involving them can be fatal.

If you are involved in an accident while hauling an infectious substance, your knowledge of proper response procedures can save lives and property.

## What Is The Danger?

Infectious substances are microorganisms or toxins which cause human disease. They can be deadly to humans, plants and/or animals and can be inhaled, absorbed or ingested. They can also contaminate water and our environment.

## Who Do You Call?

Notify the director of the Center for Disease Control at 1-404-633-5313 as soon as possible if you are in an accident involving an etiologic agent.

Check with a company representative for specific information on your company's accident-reporting procedures. In general, you must immediately report every accident in which you are involved to the local authorities and your company.

The local authorities include the police, the highway patrol, the sheriff and the fire department. Call 911 or the operator for assistance.

Know the name and phone number of the company representative you must contact, including a telephone number to reach him or her after regular office hours.

Have your shipping papers available for emergency responders.

## Protecting Yourself And Others

- Notify the shipper, the CDC and emergency personnel immediately.
- Make your shipping papers and other information available to emergency personnel.
- Stop all unnecessary movement of the vehicle.
- Isolate the vehicle.
- Stay clear of the area and keep unauthorized people away from and upwind from the area.
- No one should eat, drink or smoke in the immediate area.
- Set up warning signals.
- Avoid all contact with the material.

## National Response Center

The carrier must make a telephone report to the National Response Center at 1-800-424-8802 as soon as possible when a shipment of infectious substances is involved in a fire, spillage, breakage or suspected contamination. If a telephone report is required, then a follow-up written report must be submitted within 15 days of the accident.

# TOOL BOX TALKS
## How To Give A Tool Box Talk

Communication is one of the best ways to prevent accidents. And one of the best ways of communicating the importance of safety on a construction job is through toolbox talks. You don't have to be a professional speaker to give a good toolbox talk. But there are ways you can make your talks more effective. Let's take a look at them.

**The Agenda**

Know your topic and plan your agenda a few days before the meeting so you're well prepared. (Be able to present the talk without reading it and lead a discussion afterward.) Wherever possible use actual equipment to illustrate your points. Coordinate hand-out literature or other material you intend to use at the meeting.

Limit the length of your presentation. Given your operation, you would be the best judge of how much time to set aside. Generally speaking, a half-hour is adequate. Allow for questions and answers afterwards-about 15 minutes.

Use visual examples. There's something to be said for "Seeing is believing." ff you're talking about ladders, have one handy so that you can point out such things as loose rungs or split side rails. If you plan to talk about the danger of using patched up hand tools, show a few samples. Consider a chisel with a mushroomed head; a hammer with a taped handle.

Do a wrap-up. Reinforce the important points brought out during the meeting. Thank your staff for their interest and enthusiasm.

**The Format**

Staff the meeting out on a positive note. After welcoming your staff, promote team work and how toolbox meetings not only provide valuable information but give everyone the opportunity to get together and exchange ideas. Be sure to compliment a job well done. Morale plays a bigger part than people think in affecting productivity and job satisfaction.

Keep it informal. Even though you may be using this resource as well as others, use your own words in making the actual presentation. For effective and rewarding results, do what's comfortable for you.

Invite people to participate. The purpose of any toolbox talk is to get people to think about safety problems. Make the talk a hands-on session. Have your people name hazards and what to do about them. Encourage them to offer suggestions to improve safety. When asking questions, use open-ended questions instead of questions that require only a yes or no answer.

**The Topic**

Choose timely topics. Gear your talks to safety problems you are encountering at the moment or that you anticipate in upcoming jobs.

- Review recent injuries-
  - What happened?
  - Why did it happen?
  - What should have been done?

- Review recent safety violations-
  - What was the violation?
  - What hazard did it create?
  - What injury could have occurred?

- Review upcoming work schedule-
  - What hazards are you concerned about?
  - What safety equipment should be used?
  - What procedures should be followed?

**The Place and Time**

Hold the meeting in your work area. We recommend holding the meeting first thing in the morning or immediately after lunch when the workday will least be interrupted and the work area relatively quiet.

Hold a toolbox meeting once a week to reinforce your company" philosophy that job safety is important.

We hope our toolbox talks help you in the daily operations of your business. Keep them handy. Like any tool, they can" help unless you use them. If you have any questions, contact your EHS representative.

TOOLBOX TALKS
TABLE OF CONTENTS

TOOLBOX TALKS
TABLE OF CONTENTS (continued)

**CBS *INJURY AND ILLNESS PREVENTION PROGRAM***

## Appendix G: EMPLOYEE SAFETY TRAINING

**Location:** _____

**Date:** _____

**Conducted By:** _____

**Topic:** _____

_____

_____

**Attendees:**

| Name (Print) | Signature |
|---|---|
| _____ | _____ |
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# Protective Clothing and Equipment

## *Your Personal Line of Defense*

*Each year some 2 million workers suffer disabling injuries at work. Add to these injuries the gradual loss of hearing, eyesight and respiratory health experienced by other workers and you have an excellent case for using PPE—personal protective equipment—on the job.*

### Know Your Hazards

Workers are often unaware of the dangers in their work environments. Accidents happen fast, and many workers simply do not notice the effects of cumulative hazards until it's too late to do anything about them. Here are the facts about specific hazards in the workplace and what you can do to protect yourself.

### Unsafe Air

If the air in your workplace contains fine particles, sprays, mists or toxic gases, you should be wearing a respirator. Air-purifying respirators filter contaminants out of the air, while supplied-air respirators provide a source of air when the air around you does not contain enough oxygen. Contaminated air may not seem to be a problem; many contaminants have no apparent effect on your breathing or health until your lungs are permanently damaged. Use your respirator daily to avoid long-term lung problems.

### Eye Hazards

Do you need eye protection on the job? If anything in your workplace can fly, splash or drift into your eyes, the answer is "Yes!" Safety glasses, goggles and faceshields are designed to protect against impact from large objects, irritating fine dust, chemical splashes (always unexpected!) extreme heat and many other hazards. If you're not sure why your company requires eye protection, ask your supervisor. Chances are your company has learned about eye hazards from situations you might never have considered.


### Noise

Often workers are not aware of how much noise they are experiencing. If you have to shout to be heard on the job, you are working in noise levels over 85 decibels, enough to damage your hearing over time. Naturally ear protection is an inconvenience—you may feel you can't hear others while wearing it, but in fact most hearing protection screens out loud noises while it allows you to hear what you need to hear. OSHA-approved earplugs, earmuffs, or a combination of the two can safely and comfortably reduce ear damage (and, incidentally, lower your stress) on the job.

### "Bodyguards" for Extreme Hazards

If you're one of the few workers who must work in extremely hazardous conditions, you know that the goal of your PPE is to seal you off completely from the environment you are in. You will wear a fully enclosed chemical-and possibly heat-resistant suit with built-in boots, gloves and self-contained breathing apparatus. This type of PPE takes training to wear properly and requires an assistant to help you put it on—and get it off—without contaminating yourself. Some types of PPE for hazardous environments are disposable, eliminating the tricky problem of decontaminating them safely.

### Checklist for PPE Users

- *Check for leaks, tears, signs of wear before each use.*
- *Wear PPE properly. Ask your supervisor if you're not sure.*
- *Use the right size.*
- *Keep equipment clean (decontaminate when necessary).*
- *Follow strict guidelines for removing contaminated PPE.*
- *Report any health problems while using* PPE.

### Other Physical Hazards

Most of the options available to protect you from physical hazards—steel-toed boots, chemical-resistant gloves, hard hats, eye and face protectors, protective coveralls—seem bulky and uncomfortable until that unexpected moment when you really need them. By then it's too late to put them on. Think about it. Your company isn't likely to waste good money buying, and training you to use, protective equipment that you don't need. They do it because it's to their benefit to have you on the job rather than in a hospital. The good news is that designers are making lighter, stronger, more comfortable (and, in some cases, more fashionable!) PPE than ever before.

# Dressed for the Occasion

As you know, there is right and wrong clothing. On the job, when we talk about "dressing for the occasion," we don't mean you should wear a dinner jacket in the lunchroom. We're concerned with two things here: safety and comfort.

Let's consider safety. Even if you don't need special protective equipment like gloves, arm and shin guards, and masks, the style of your clothing is important to your safety. Avoid clothing that can catch in machinery: full sleeves, loose cuffs, long neckties, and pocket flaps. The same goes for jewelry such as bracelets, watch chains, and rings. Keep your cuffs buttoned and shirt tail tucked in. Fuzzy shirts or flammable synthetic material are dangerous around flames or sparks. Beware of clothing that can cause you to trip or slip: slick soled shoes, loose or frayed shoelaces, pants that are too long or have drooping cuffs that get caught on your heel as you back down a ladder. Use gloves for rough work but never around moving parts.

How you take care of your clothes can make a big difference in your safety. Clean clothes are safer. Oily, greasy clothes catch fire easily; dust and grease irritate your skin.

For most of us, dressing for the occasion means dressing for comfort as well as safety. In summer, lightweight cotton is more comfortable than synthetics, while wool is the ideal choice for winter. It provides warmth even when wet. Two lightweight layers of wool keep you warmer than one heavy layer and allow you to adjust your clothing as the day warms up. Remember, it's the air space between your skin and the outer layer of clothing that keeps warmth in, so avoid tight clothing that provides little insulation and may cut off your circulation. In the wind a tightly woven shirt or windbreaker works better than a sweater. Woolen gloves are warmer than leather; wool-lined leather gloves keep your hands warm while they protect them against rough objects.

Work outdoors a lot? Researchers are learning that the longterm effects of sun can be deadly. If you are fairskinned, wear a brimmed hat and longsleeved shirt outdoors or protect your skin with a good sunblock.

A word about shoes: there is nothing that can improve your outlook like a pair of comfortable shoes. Shoes should keep your feet dry and warm, support them, and cushion them against the assault of concrete floors. Always wear the right shoes for your work environment. If you wear rubber boots, keep your feet warm with heavy woolen socks or boot liners. Get the size right—tight shoes pinch your toes and cut off circulation so your feet get cold. On the other hand, overly loose shoes may cause you to stumble or twist an ankle. Keep your shoes in good repair to protect your feet from sharp objects.

At work, if your clothes are safe and comfortable, you know you're "dressed for the occasion."

# Eye and Face Protection
## *Safety Glasses*

*If your job involves hazards from dust, flying objects or particles that may strike you from in front, you should be using some form of safety glasses. If you normally use a faceshield in operations such as welding, you also need to wear safety glasses under your faceshield. The good news about safety glasses is that you can now get them in attractive styles that are at home in both the workroom and the boardroom.*

**Safety glasses are strong enough to withstand the impact of a quarter-inch steel ball traveling 150 feet per second.**

### What Makes Them "Safety" Glasses?

Resistance to impact is the main difference between safety glasses and regular glasses, which often look just like them. The American National Standards Institute (ANSI), which sets standards for safety glasses, requires them to withstand the impact of a quarter-inch steel ball traveling 150 feet per second. You can't depend on your prescription glasses for this kind of protection. Frames stamped with the imprint "Z87" meet stringent standards for strength and heat resistance.

**Glasses with side shields provide more protection when hazards come from the side. Eye-cup shields offer the greatest protection when hazards come from above and below as well as the side.**

### Kinds of Safety Glasses

It is important to remember that standard safety glasses protect against impact from the front only. For this reason you can also get safety glasses with side shields to provide limited protection from the side for tasks such as sanding, buffing, and drill-press work. When hazards come from above and below as well as the side, as in lathe work or other high-speed cutting and shaping operations, safety glasses with eye-cup side shields, which curve around the eye area, offer the greatest possible protection. If you need still more eye protection, consider using goggles or a face mask over your safety glasses.

### Types of Lenses

What kind of lens is best for you? Glass lenses resist scratches and chemical damage and are easy to use in prescription glasses, but they are much heavier than other materials and shatter more easily. Although polycarbonate and plastic lenses do not resist scratching as well, they are much lighter and are more impact-resistant than glass lenses. You can even get safety glasses with prescription lenses.

### Care and Use

Your safety glasses are designed to protect you from accidental injury. They will not withstand repeated impact or abuse, however. Inspect them regularly for scratches, cracks or other wear and replace them if they are scratched, bent or uncomfortable. Scratches not only interfere with your ability to see what you're doing—a hazard in itself; they also can weaken the structure of the lens and its resistance to impact. Lenses can be coated with special substances to keep them from fogging up or to make them more scratch-resistant. Keep your glasses clean according to the manufacturer's instructions (clean plastic lenses *only* under running water to avoid scratching them) and store them in a clean dry place, preferably in a case with your name on it. You may need to wear a headband or straps with your glasses to keep them from falling off.

Taking care of your glasses according to company policy and, above all, using them, will help you "look" your best on the job.

# Eye and Face Protection

## *Safety Goggles*

*Safety goggles offer effective protection from impact, flying particles coming from many different directions, and chemical splashes—more than that offered by safety glasses. For this reason goggles have become widely used in industry. They should be worn during grinding, chipping, woodworking and riveting operations as well as in the lab to protect from chemical fumes and splashes. Specially designed goggles may be worn over your regular prescription glasses. (If you wear contact lenses, let your supervisor know. Your company may have a special policy regarding contacts, which may be hazardous to your eyes in some operations.)*

### Types of Safety Goggles

Goggles are surrounded by a shield that fits snugly on the face all the way around the eyes. Because of their snug fit, the shields of standard safety goggles have ventilation holes to keep them from fogging up. Some goggles have hooded or indirect ventilation openings to keep out thick hazardous dust, chemical splashes or molten materials. The following goggles are worn in special situations:

- Wire-screen goggles have a wire-mesh lens instead of a glass or plastic lens to provide the greatest ventilation while protecting from flying particles.
- Respirator goggles are designed with a high nose bridge so they can fit with a half-mask respirator.
- Rubber-frame goggles protect from fast-moving fine dust rather than major impact hazards.
- Visor goggles provide shading from overhead lights and extra protection from falling chips and particles.
- Splash goggles are not ventilated for the greatest possible protection against chemical splashes and hazardous mists and dusts. They must be specially coated to prevent fogging.
- Tinted goggles reduce glare from bright lights or molten materials.

**Safety goggles are the most widely used type of eye protection. Goggles offer more protection from impact, flying particles and chemical splashes.**

### Choosing the Right Goggles

When choosing your goggles or other protective eyewear, make sure they are certified by the Safety Equipment Institute (SEI) to conform to American National Standards Institute eyewear standards. Select goggles that fit snugly but comfortably around the bridge of the nose, cheeks, temples and forehead. The strap around the base of the head should hold the goggles secure. If your work requires side vision for complete safety, keep this in mind when you choose goggles, or consider using safety glasses instead.

### Care and Use

No matter how well made your goggles are, they are going to interfere with your field of vision to some degree. Keeping your goggles as clean as possible according to the manufacturer's instructions will minimize this hazard. Avoid storing your goggles with other things on top of them that could bend or distort them. Replace scratched or cracked lenses; scratches lessen the impact resistance of the goggles and impair your ability to see.

Safety goggles can protect you from many kinds of hazards, but only if you wear them. Make it a habit to wear your goggles on the job, and your eye-safety outlook will always be "20/20."

# Eye and Face Protection
## *Faceshields*

*For all-purpose face protection, faceshields are hard to beat. They protect the face from splashes, heat, flying particles and other hazards while allowing for plenty of ventilation. They are especially recommended for welding, riveting and operations that involve extreme heat. But it is important to remember that faceshields do not protect your eyes—they must be used in combination with goggles or safety glasses.*

**Faceshields protect you from splashes, heat, flying particles and other hazards. A welding helmet is a specialized faceshield that protects you from sparks, intense light and splashes of molten metal.**

### Types of Faceshields

Most faceshields are constructed of high-strength, flexible plastic such as acetate. Faceshields designed for use in a high-impact environment may be made of polycarbonate, the material used in many safety glasses. Wire-screen faceshields are used in extremely humid environments. Faceshields may be equipped with a crown to protect against falling particles or sparks, or a chin scoop to guard against chemical splashes. Some shields are tinted to protect from glare, while others feature glass inserts for the best visibility. Specially designed faceshields can be fitted to hard hats. A variation on the faceshield is the welding helmet, a complete face-and-head covering that protects the wearer from sparks, intense light and splashes of molten metal.

### Care and Fit

Choose a faceshield with adjustable straps that fits snugly but not uncomfortably around your head, without sliding forward or to the side. A faceshield should not be uncomfortable to wear. A strap across the top of the head provides support. The shield should cover your face from the forehead to the base of your neck without obstructing your vision. Because faceshields are easily scratched, store your shield in a protected area. Replace a scratched faceshield before it causes a vision-related accident.

Remember, a faceshield protects your face, not your eyes. Wearing your safety glasses or goggles along with your faceshield is the best way to protect your eyesight.

# Protective Clothing and Equipment

## *Gloves*

*According to the National Safety Council, hands are the body parts most frequently injured on the job. Many of these injuries can be avoided if you follow precautions and wear the proper hand protection for your job.*

### Make the Right Match

Whether you work with heat, sharp or abrasive objects, strong chemicals, or electrical or biological hazards, be sure to use the gloves that are right for your job. This is especially important in the case of chemical and electrical hazards, which require specific types of gloves. Gloves for working around electrical hazards are color-coded for their resistance to different levels of voltage, while gloves for chemical hazards are designed to resist the chemicals you are working with; gloves made of the wrong material could literally dissolve before your eyes. You must wear fire-retardant gloves around open flame, while reflective gloves (such as aluminized gloves) are best for intense radiant heat. Use this chart, along with your supervisor's recommendation, to help select the right glove for your work.

| Hazard | Gloves |
|---|---|
| mild heat, cold, sharp edges | fabric gloves |
| electricity | rubber gloves with insulated liners (color-coded for high-voltage protection) |
| chemicals, corrosives | rubber, neoprene, vinyl |
| sparks, rough surfaces, scraping | leather gloves |
| extreme heat | leather, wool, terry cloth, glass fiber, aluminized fabric |
| radiation | lead-lined gloves |
| knives, sharp cutting edges | metal-mesh gloves |
| food handling, health services | disposable plastic |

### Other Hand Protection

In addition to gloves, you may be required to protect your hands and forearms with hand pads (for extreme heat, roughness, splinters), finger guards, or long cuffs or forearm protectors. Barrier creams increase the glove's protection against chemicals or may be used to protect against mild chemical exposure when gloves cannot be worn.

### Using Gloves Properly

Make sure you wear gloves that are the right size. Gloves that are too small tire your hands and wear out quickly, while too-large gloves interfere with your dexterity and increase the likelihood of an accident. Check with your supervisor before wearing gloves around machinery with moving parts—they can get caught.

### Chemical Gloves: Care Is Critical

Gloves used to protect against chemicals and corrosive substances require special treatment. Inspect them carefully before each use and don't use them if they are torn, cracked or swollen from exposure to solvents. Rinse them before taking them off and clean them thoroughly before putting them away, so that chemical residue doesn't build up on them. Store them away from light, right side out, with the cuff unfolded—this allows remaining chemical vapors to escape more easily. Wash your hands thoroughly, even though you've been wearing gloves.

The most important way to protect yourself is to pay attention to what you're doing. Stay alert to hand safety hazards, follow guidelines for equipment use, and use the right gloves for the situation.

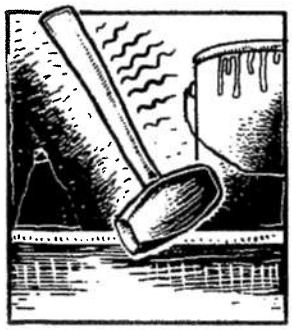
# Protective Clothing and Equipment

## *Keep Your Hat On*

*It's a simple fact—a hard hat can save your life. Let's take a look at how this important piece of equipment does its job.*

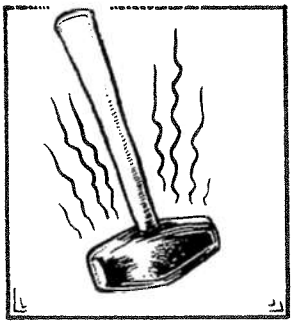
### Anatomy of a Hard Hat

As the name suggests, hard hats are made of semirigid materials such as fiberglass, thermoplastics or aluminum. Full-brimmed hats (such as those worn by firefighters) have a brim that extends all the way around the hat to protect the back and sides of the head, neck and shoulders. Visored hats have a brim only in front, an advantage in tight spaces. Inside the hat are straps that pass over your head and connect to an adjustable headband. These straps act like a cradle that holds the shell of the hat away from your head—there should be an inch and a quarter between you and the shell. Chin and nape straps keep the hat from being bumped or blown off. Your hard hat should carry the American National Standards Institute label (ANSI Z89.1) next to the manufacturer's name, and a Class A, B or C marking.



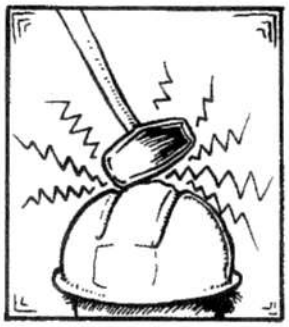
### Types of Hard Hats

All hard hats protect you from the impact of falling objects. Class A hard hats also protect against electric shock from low-voltage conductors, and Class B hard hats protect from high-voltage shock. Your hard hat may have accessories such as a faceshield mount and brackets for attaching a lamp or hearing protectors.



### How They Protect

A hard hat can protect you from the impact of a hammer dropped from two stories above you. A hard hat does this because the shell is flexible enough to absorb some of the shock of the hammer and transfer the rest of the impact to the webbing inside the hat, which stretches to absorb and distribute the remaining shock over a wide area of the head and body.



### Use It Right

Because of its carefully designed construction, it is essential that you use your hard hat in the way it was intended. This means keeping that space between the webbing and the shell open, no matter how convenient a storage space it may seem to be. Avoid wearing headgear under your hard hat, except for cold-weather liners specially designed for it. And, when it comes to hard hats, "neither a borrower nor a lender be." Your hat straps should be adjusted to fit you and you only: snug but not tight. The hat should not tilt or slide around.

### Take Care of It

Proper maintenance of your hat includes inspecting it every time you use it. Check for scratches, cracks, dents or brittleness. Wash the webbing in detergent at least every 30 days, and replace it when it seems worn or frayed. Avoid drilling ventilation holes, painting your hat (paint solvents can weaken the shell), or covering the shell in any way so you can't inspect it. And remember, a hard hat can protect you from a powerful impact only once. Because of this, avoid dropping or throwing your hat, and ask for a replacement if you get hit. Your employer would much rather replace your hard hat than replace you. Many companies have a policy of replacing the shell and the webbing at regular intervals even when there is no visible damage.


### Use Your Head

By following safe work procedures, keeping your protective headgear in good working order, and, most of all, using your hard hat when appropriate, you can avoid being one of the 70,000 people who will be disabled by head injuries this year.

# Standing on Your Own Two Feet

## *And Other Reasons to Use Foot Protection*

*Do you wear safety shoes on the job? If you think you don't need them, consider that about one in five work-related accidents involves the foot and leg. Falling objects cause most of these, but compression, punctures, burns and slipping on wet surfaces are also common. All these accidents are easily prevented by wearing the proper safety shoes.*

### Style and Comfort

When you get ready to choose a pair of safety shoes, you are going to be surprised at the options available to you. Today's safety shoes come in a wide variety of types, styles, materials and weights. Many safety shoes look just like street shoes and cost very little more. And they are comfortable! The average safety shoe weighs only 1 1/2 ounces more than street shoes. Let's look at some of the kinds of workplace hazards that you may encounter and the types of shoes designed for them.

### Mechanical Hazards

Falling objects, compression from rolling objects, and punctures are easily the top three sources of foot injury, and the ones the standard safety shoe protects against. Typically, your safety shoe will have steel toe caps to guard against injuries from falling objects and compression, and instep protection of aluminum, steel, fiber or plastic to protect the top of the foot. Steel insoles or reinforced metal soles protect from puncture. To protect against slipping on wet or oily surfaces, use wooden soles or cleated, non-slip rubber or neoprene soles. Icy surfaces may require strap-on cleats.

### Electrical Hazards

The buildup of static electricity on your body can be dangerous when you are working near explosive or highly flammable substances. Workers in such environments wear safety shoes with leather, cork or other conductive soles and no exposed metal, which could cause sparking. For protection from live electrical current, shoes, including metal parts, must be thoroughly insulated with rubber soles. For high-voltage hazards, use conductive shoes, insulated shoes with a connector from calf to heel to pass electricity to the floor or ground. Electrical-hazard shoes must be kept dry.

### Extreme Heat or Cold

In extreme cold wear shoes with moisture-proof insulation and insulated socks. Wooden-soled shoes or slip-on sandals protect against heat; surfaces too hot for wood soles require aluminized heat-protective shoes or boots. When working around molten metal and sparks, use foundry boots with elastic gores for quick removal in case hot metal or sparks get inside.

### Chemical Hazards

Many chemicals and solvents can burn or eat away ordinary shoe materials. For protection from these hazards wear rubber, neoprene or plastic footwear, depending on the type of chemical you are exposed to and your company's policy.

### Other Protection

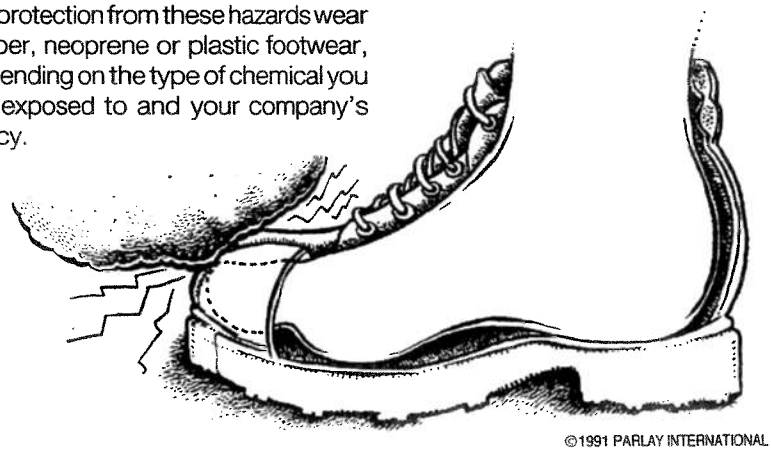
Your job may require additional protection, such as metatarsal guards, which cover the top of the shoe for greater protection from falling objects; puncture-proof inserts; shin guards; or metal footguards, which strap over the shoe. Disposable plastic overshoes protect against infection and contamination from sanitation hazards.

### Your Shoes

Be sure your safety shoes are approved by the American National Standards Institute (ANSI)—the rating should be stamped inside your shoe. Choose shoes that you can wear comfortably for hours. For the best protection, keep your shoes clean and dry, and inspect them regularly for cuts, cracks and embedded metal. Replace them when they get worn.

If you follow company rules for safety and protective equipment, stay on the lookout for hazardous conditions and equipment, and wear protective footwear appropriate for your job, you can be sure that you are doing everything.

Preventing workplace injuries is a matter of life and limb. Protect yourself by wearing the right protective footwear for your job.



# Hearing Protection
## *Earplugs*

*Does your company provide you with earplugs or other hearing protection? If so, you may be wondering if they are necessary or if you will be able to communicate when wearing them. The good news is that earplugs do not lessen your ability to hear your co-workers; if you need earplugs, your workplace is so noisy you can't hear them anyway. And earplugs can screen out background noise (in much the same way that sunglasses screen out background glare), actually making it easier for you to hear sounds such as the human voice.*

### TYPES OF EARPLUGS

*There are three general categories of earplugs:*

**1.** Formable earplugs, made of waxed cotton or acoustical fibers, can be molded to fit your own ears. They are disposable. Semidisposable plugs of molded foam are used for up to a week.

**2.** Premolded inserts of soft silicone rubber or plastic are reusable; some come in different sizes.

**3.** Custom-molded earplugs are molded to fit the individual; silicone rubber or plastic molding compound is placed in each ear and allowed to set. The set compound may be used as earplugs or as molds for ear-plugs.

### Effectiveness

Earplugs may reduce noise levels by up to 30 decibels. That is, if the noise in your environment is 100 decibels, your earplugs could effectively reduce it to 70 decibels. When choosing earplugs, check the Noise Reduction Rating (NRR) on the package. The higher the number, the better the protection.

### Fit and Maintenance

To work properly, earplugs must completely fill the ear canal. When inserting earplugs, grasp your ear from behind your head with your opposite hand, and pull up to straighten the ear canal. Insert the earplug until it blocks sound; then hold it in place for a moment while it expands. Make sure your hands are clean when inserting plugs, and keep reusable plugs clean by washing them after each use in warm soapy water, to avoid ear infection.

**To insert an earplug properly, grasp your ear from behind your head with your opposite hand and pull up to straighten the ear canal. Insert the earplug until it blocks the sound, then hold it in place for a moment while it expands. To prevent ear infections, wash your hands first.**

Properly fitting earplugs need not interfere with your comfort or ability to hear important sounds. And they can protect you from gradual loss of hearing that you may not notice until permanent damage has occurred. By knowing what noise levels require hearing protection, getting your hearing tested at least once a year, and taking responsibility for using hearing protection, you are making a "sound" investment for your future.

### Who Needs Earplugs?

**If you have to shout to be heard by someone standing three feet away, the noise level is probably more than 85 decibels. Continuous exposure to this level of noise can cause hearing loss.**

If you have to shout to be heard by someone standing three feet away, you are in an environment with over 85 decibels of noise—a level that, if it continues over the eight hours of your workday, will eventually damage unprotected ears. Your choice of earplugs, earmuffs or canal caps should be based on comfort, noise intensity and duration, and company policy. Earplugs have the advantage of being lightweight, inexpensive and, if disposable, low-maintenance. They are the protectors of choice for work in hot, enclosed environments or in situations where you keep hearing protectors on all day. They may be easily worn under hard hats and other head protection, as well as with eyeglasses. Because earplugs are difficult to remove and put in properly, and some must be thrown away when removed, they are a less desirable choice if you are wearing hearing protection only part of the time. Canal caps, another option, are like earplugs on a headband: the headband holds the caps tightly in the opening of the ear canal. They are lighter than earmuffs and easier to get on and off than earplugs.

# Hearing Protection
## *Earmuffs*

*"What did you say? Let me get my earmuffs on, so I can hear you." This remark may seem strange if you're not in the habit of wearing hearing protection. But in a noisy workplace where you have to strain to hear someone two feet away, hearing protection is not only necessary to protect your hearing, it can also help you hear the sounds you want to hear. Earmuffs and other protective devices enable you to pick out sounds from a background of noise in much the same way that sunglasses help you see objects in glaring sunlight.*

### Earmuffs— Who Needs Them?

If your employer has made earmuffs or earplugs available to you, the usual noise level in your workplace probably exceeds 85 decibels—and that's loud enough to damage your hearing over time. When there is a choice of hearing protectors, the choice you make depends on several factors, such as comfort, loudness of noise, and whether the noise is consistently loud. Earmuffs are easier to put on and take off than earplugs, and so are the best choice if you do need them all the time. However, they are bulky and relatively expensive, and may not fit well with other protective equipment such as hard hats, respirators and eyeglasses. If you work in a very noisy environment, you may need to use earmuffs and earplugs together for added protection.

### The Typical Earmuff

Earmuffs consist of cushioned cups attached to a headband that may be worn over the head, behind the neck or under the chin. Cups are made of molded plastic and filled with foam or similar material. They should adjust up and down, in and out, for a good fit. Cushions filled with foam, liquid or air cover the cups and completely seal them around the ears. Specialized models are available: cap-mounted earmuffs can be attached to safety hats; dielectric earmuffs (for workers exposed to high voltage) do not have metal parts; and electronic earmuffs reduce hazardous noises while magnifying sounds you need to hear. Earmuffs reduce noise about 20 to 30 decibels; the Noise Reduction Rating (NRR) on your earmuffs indicates their effectiveness.


### Effectiveness Depends on Fit

Your earmuffs should fit comfortably, the headband neither too tight nor too slack. To work right, earmuffs must form a seal around the ears, completely enclosing them, without pinching the earlobes. No hair or clothing should stick out from under the cups. Your eyeglasses may need to be modified to fit with earmuffs. Follow manufacturer's instructions for cleaning and storage, and replace hardened, cracked or worn cushions.

When properly used, alone or in combination with earplugs, earmuffs can be an effective way to protect your hearing. For the best protection, have your hearing tested at least once a year and compared to previous tests, understand the effects of noise on your hearing, and wear your earmuffs whenever your job requires them.

# Respiratory Protection

## *Respirators Defend Your Lungs*

*Your body works hard to protect your respiratory system from airborne contaminants. Your nose begins the job by filtering out large particles and warming and moistening the air as it enters your body. A blanket of mucus lining the tubes to your lungs traps smaller particles, which are moved back up toward your throat by the action of tiny hairs, called cilia, that line your air passages. Your cough reflex completes the task of getting rid of contaminants. That's why smoke and dust make you cough—your body is just doing its job. Your lungs then move the 20% of the air that is pure oxygen into your bloodstream where your body can use it.*

### When You Need a Respirator

But what if your body's air filtration system is bombarded with too many contaminants? When your air passages are overloaded, they will not be able to prevent this material from getting to your lungs. Contaminants can have an immediate and noticeable effect when they irritate your lungs, but much more dangerous are the long-term effects of a buildup of contaminants over time. Often a victim of this sort of hazard is not aware of the problem until the lungs are damaged permanently. Fortunately, respirators can prevent this kind of damage by filtering out these particles for you.

### Air-Purifying Respirators

If you are working in an environment that produces dusts, fumes or harmful mists, you should be using an air-purifying respirator (APR) containing a filter designed for screening out these contaminants. These may be simple disposable face masks or rubber masks fitted with disposable or cleanable filters.

### Cartridges and Canisters

Gases and vapors make up another group of health hazards. These substances are not really particles—they are dissolved in the air, so your air passages have no way of getting them out. Furthermore, such gases can pass through your lungs to enter your bloodstream, damaging your body and brain. When working around these hazards, you need an APR fitted with

a cartridge or canister that absorbs or chemically reduces dangerous gases. The type of cartridge or canister you use must be specific for the gas in your work area—the wrong one will have no safety effect at all. And it must be replaced according to manufacturer's guidelines when it is used up.

### Supplied-Air Respirators

Remember how much oxygen there is in pure air? That's right—20%. If the atmosphere in your workplace has such a high level of contaminants that there is not enough oxygen left in the air to support life, it will not do any good to filter the air. You need to replace that air with an outside source. Supplied-air respirators (SARs), also called air-line respirators, connect the user, by means of an air hose, to an outside source of clean air supplied by a compressor or compressed-air cylinder. You may also need this type of respirator if the contaminant in your workplace cannot be filtered or absorbed by ordinary APRs. Other situations requiring SARs are oxygen deficient environments and environments that are dangerously hot or cold or so toxic that they have been identified as "immediately dangerous to life and health" (IDLH). Under IDLH conditions you must use a respirator that provides positive air pressure so there is no chance of contaminants being drawn into the mask when you inhale.

### Self-Contained Breathing Apparatus

Sometimes working conditions do not permit the use of air lines. With a self-contained breathing apparatus (SCBA) you carry a supply of air in a portable tank on your back. Use SCBAs when you need great mobility, when falling objects or machinery can damage an air hose, or when the job to be done takes 30 minutes or less. They may also be used when you are first entering an environment in which the air quality is unknown.

If your lungs are the gateway to your body, your respirator is like a guard at the gate. In order to protect yourself, you must make sure your guard is armed with the right weapons. This means choosing the appropriate respirator for your working environment.

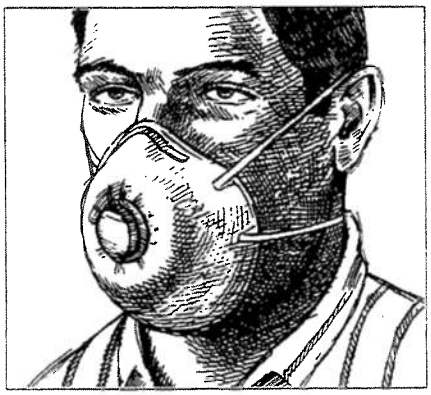
# Respiratory Protection

## *Air-Purifying Respirators*

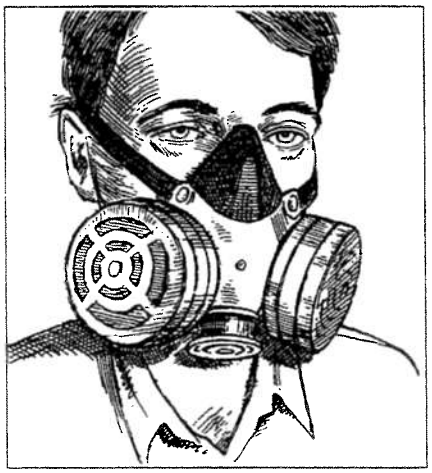
*Industrial safety has come a long way since the days when miners and other workers regularly suffered from chronic lung diseases that shortened their lives and left families without their earnings. The air-purifying respirator (APR) is directly responsible for the increased life expectancy of today's industrial workers. This broad class of respirators, used wherever the air is contaminated with low levels of particles, gases or toxic vapors, includes any device that filters or purifies the air in various ways. They may be half masks, which cover your nose and mouth, or full-face masks, which cover your eyes. Because each type of APR is useful only for a specific situation, it is important for you to know what contaminants exist in your work area and what respirator is right for them.*

### Particle-Filtering Respirators

These respirators provide a physical barrier to dusts, mists, fumes and fibers from operations such as grinding, sawing, sanding, polishing, mining, and asbestos removal. The simplest ones are disposable and fit loosely over the nose and mouth. They must be replaced frequently as the pores in the filter become clogged with particles and breathing becomes difficult. While disposable respirators protect against contaminants that are not toxic in small amounts, more extreme hazards, such as asbestos fibers, require a respirator that fits tightly over the face and that contains a replaceable filter or one that can be removed and cleaned. These respirators do not protect against gases or oxygen deficiency.



**Use particle-filtering respirators to block dusts, fumes and fibers. Change masks often.**



**Toxic gases or vapors are absorbed or neutralized by chemicals in cartridges. Use the right cartridge for the hazard and replace it regularly.**

### Vapor- and Gas-Removing Filters

Gases and vapors (fumes from liquids such as solvents) are dissolved in the air and thus cannot be trapped by a particle filter. Respirators designed for these contaminants filter incoming air through one or more cartridges or canisters containing chemicals that either absorb or chemically change the offending gas. They may also have a particle barrier, and some respirators contain more than one type of cartridge for filtering several hazardous vapors at once. An exhalation valve allows air you breathe out to escape the mask and then closes so contaminated air cannot enter.

### Change Cartridges or Filters Regularly

Cartridges eventually get used up and must be replaced according to the schedule for your particular respirator and cartridge. Because each type of cartridge filters only a specific hazard, follow directions carefully to make sure that the cartridge is appropriate for the level of contaminants you encounter and that it is threaded correctly into place. Most cartridges are color-coded to identify their uses.

**Keep your air-purifying respirator clean and inspect it often for cracks, dents or hardening.**

### Good Maintenance

Keep your APR clean and inspect it regularly for cracks, dents or hardening. Always do positive and negative pressure tests each time you use your respirator, and, above all, if you have difficulty breathing or notice an odor, an irritation or a warming of the air you breathe, get out of the hazardous area immediately. Your respirator may be defective or need a fresh cartridge or filter. (But, don't wait until you notice an odor to change a cartridge because not all contaminants are detectable.) And remember, air-purifying respirators do not work in highly contaminated environments or in oxygen-deficient situations. Using the right respirator for the right task is your key to good health.

# Respiratory Protection
## *Checking the Fit*

*Choosing the right respirator for your workplace may be an easy task—most likely, your employer has made that decision for you. But only you can make sure your respirator fits properly. And if it doesn't fit, you might as well not wear it at all.*

### Making It Fit

All respirators have one thing in common: they work best if (and some work only if) they fit snugly to your face. Whether you use a full-face respirator or one that covers only your nose and mouth, choose a respirator that's the right size for you and feels comfortable. Do not try to make a respirator more comfortable or better fitting by altering it in any way or repairing it with parts from another respirator. Follow instructions for putting it on, adjusting the straps if necessary. When a respirator fits properly, the soft, pliable edges of the mask will mold to form a seal to your face, preventing contaminated air from entering. Adjust disposable fiber masks by pinching the metal nose strip to fit around your nose. If you wear glasses with a full-face mask respirator, you may need a specially modified model. (Contact lenses should not be worn with a respirator since pressure changes can pull them off your eyes.)

### Causes of Leaks

What if your respirator fails the tests? Check the respirator for cracks or hardening that may prevent a tight seal. In addition, make sure no hair sticks out from under the edges of the face mask. Beards, mustaches and long sideburns will interfere with the seal.

### Be Aware

As you work, be alert to any changes in the air you breathe. If you suddenly notice an unusual taste, smell, irritation or warming of the air you inhale, or if breathing becomes difficult, get out of the hazardous area immediately and do the pressure tests. If pressure is maintained, you may need to change the filter or cartridge on your air-purifying respirator or check the air supply of your supplied-air respirator. But, remember that not all hazardous substances cause odor or irritation. The best way to avoid contamination is to test your respirator's fit regularly, whether you notice a change or not.

## Testing the Fit

CHECK THE MASK'S SEAL IN THE FOLLOWING TWO WAYS:

1. Positive pressure test: Cover the exhalation valve so that air cannot escape through it; then exhale gently. The mask will bulge, and you should feel increased air pressure until you inhale or uncover the valve. This means that no air is escaping the mask.

2. Negative pressure test: Cover the air intake ports of the respirator with your palms and inhale. Not only should it be difficult to inhale, but the soft parts of the respirator should collapse inward toward your face and remain that way as long as you are inhaling. This means that no air is getting into the mask from the edges. If you feel air coming in and the mask regains its shape, there is a leak that must be corrected before you use the respirator.

Perform these tests each time you use your respirator, and enter your work area only if your respirator passes them. Some employers provide a test atmosphere of banana oil or irritating smoke: If your mask is leaking, you will detect an odor or irritation.

# Respiratory Protection
## *Maintaining Your Respirator*

*Each time you use your respirator, inspect it carefully before putting it on. Look for cracks, dents or holes in the mask, and broken or worn straps or buckles. Elastic straps that have lost their stretch need to be replaced. You need a new respirator if the flexible material around the edges of the respirator has become hard and brittle because it will no longer provide a tight seal on your face. Valves must be clean and functioning properly. Dry or cracked valves should be replaced. Replace your disposable respirator when it becomes clogged or breathing becomes difficult.*

### Replace Filters
Check the cartridges or filters of your APR before each use. Are they changed according to company policy? Are they the right cartridges for your job? Remember, APR cartridges will filter out only the contaminants they were designed for. When replacing cartridges, be sure they are threaded properly and, of course, do pressure tests after replacing cartridges or filters.

### Maintenance
Your respirator should be maintained by persons trained to do so. New valves, hoses and other parts should be installed according to company policy or when they appear worn. Use only approved parts. Avoid exchanging parts from one model to another.

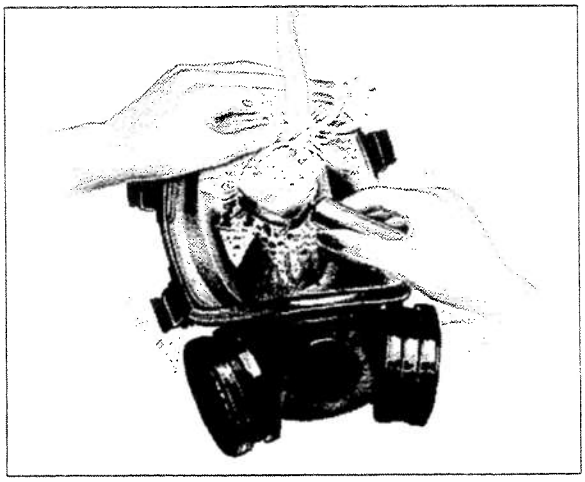
### Keeping It Clean
Clean your respirator after each use according to manufacturer's instructions. For most respirators this means washing in mild soapy water and scrubbing with a soft brush if necessary. Rinse in clean, warm water and dry according to instructions. If sanitizing is necessary, leave the respirator in the recommended disinfecting solution for at least two minutes and rinse thoroughly. Never use solvents or harsh cleaning agents on rubber or plastic parts.

### Storing It
Sunlight and chemicals in the atmosphere can damage your respirator. Seal your thoroughly dry respirator in a plastic bag and store it away from direct sunlight. Avoid placing objects on top of it; if it loses its shape it will not fit properly.

**Change cartridges whenever your company's safety program recommends it. Use the right cartridge for the hazards you face and do pressure tests after replacing cartridges or filters.**

### Be Alert
Your safety on the job depends on your ability to wear a properly functioning respirator and still do your job. Check with your supervisor if your respirator interferes with your ability to see, hear or be heard properly, or if it restricts movement so that you cannot safely do your work. If you experience difficulty breathing, fatigue, irritation in your eyes or respiratory system, dizziness or illness, leave the work area immediately and report to your supervisor. These could be warning signs that your respirator is not working properly.

Your on-the-job respiratory health is guaranteed when you properly maintain, store and use your respirator.



**Most manufacturers recommend cleaning your respirator in mild soapy water. You may need to use a soft brush to scrub away contaminants.**

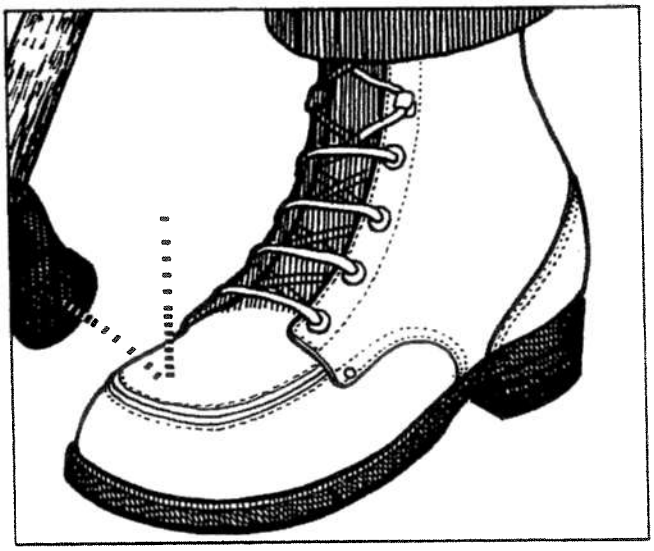
# CHOOSING AND USING WORK SHOES

## *Safety Shoes And Boots*

Who thinks about their feet? Well, each year at least 120,000 workers certainly do. That's because each of them suffered from an accidental foot injury while on the job. And what are most of them thinking about? Chances are, it's the realization that their accidents could have been prevented by using common safety sense and wearing the appropriate protective footwear. The following is a guide to the most common types of protective footwear and the types of hazards they protect against.

### Steel-Reinforced Safety Shoes

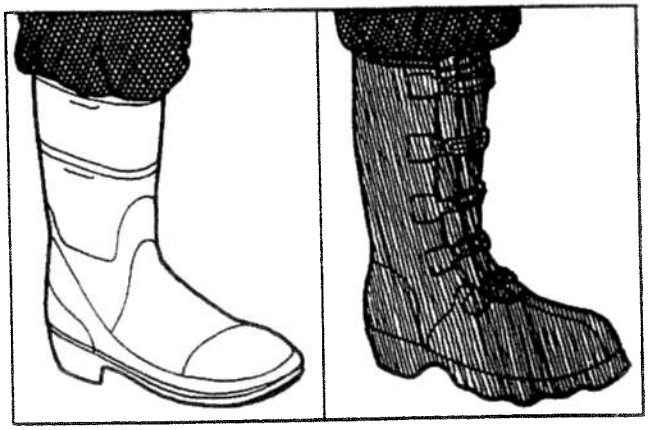
These shoes are designed to protect your feet from common machinery hazards such as falling or rolling objects, cuts, and punctures. The entire toe box and insole are reinforced with steel, and the instep is protected by steel, aluminum, or plastic materials. Safety shoes are also designed to insulate against temperature extremes and may be equipped with special soles to guard against slip, chemical, and/or electrical hazards. Other protective footwear (such as metatarsal and shin guards) can be used in conjunction with standard safety shoes.



**Steel-reinforced safety shoes protect your feet from falling or rolling objects, cuts, and puncture injuries.**

### Safety Boots

Safety boots come in many varieties and which you use will depend on the specific hazards you face. Boots offer more protection when splash or spark hazards (chemicals, molten materials) are present. When working with corrosives, caustics, cutting oils, and petroleum products, ***neoprene*** or ***nitrile*** boots are often required to prevent penetration. ***Foundry or "Gaiter" style boots*** (often used in welding operations) feature quick-release fasteners or elasticized insets to allow speedy removal should any hazardous substance get into the boot itself. When working with electricity, you may need to wear special ***electrical hazard boots*** which are designed with no conductive materials other than the steel toe (which is properly insulated).



**Boots offer more protection when splash or spark hazards (chemicals, molten materials) are present.**

### Using Protective Footwear

There are many types and styles of protective footwear and it's important to realize that your job may require additional protection other than that listed here. Features such as slip-resistant soles, for example, will vary from one shoe to the next, depending upon the particular type of slip hazard you come in contact with. Whatever your specific requirements are, you can ensure that your footwear meets established safety standards by checking for the American National Standards Institute's (ANSI) label inside each shoe.

# TOOL BOX TALKS
## How To Give A Tool Box Talk

Communication is one of the best ways to prevent accidents. And one of the best ways of communicating the importance of safety on a construction job is through toolbox talks. You don't have to be a professional speaker to give a good toolbox talk. But there are ways you can make your talks more effective. Let's take a look at them.

**The Agenda**

Know your topic and plan your agenda a few days before the meeting so you're well prepared. (Be able to present the talk without reading it and lead a discussion afterward.) Wherever possible use actual equipment to illustrate your points. Coordinate hand-out literature or other material you intend to use at the meeting.

Limit the length of your presentation. Given your operation, you would be the best judge of how much time to set aside. Generally speaking, a half-hour is adequate. Allow for questions and answers afterwards-about 15 minutes.

Use visual examples. There's something to be said for "Seeing is believing." ff you're talking about ladders, have one handy so that you can point out such things as loose rungs or split side rails. If you plan to talk about the danger of using patched up hand tools, show a few samples. Consider a chisel with a mushroomed head; a hammer with a taped handle.

Do a wrap-up. Reinforce the important points brought out during the meeting. Thank your staff for their interest and enthusiasm.

**The Format**

Staff the meeting out on a positive note. After welcoming your staff, promote team work and how toolbox meetings not only provide valuable information but give everyone the opportunity to get together and exchange ideas. Be sure to compliment a job well done. Morale plays a bigger part than people think in affecting productivity and job satisfaction.

Keep it informal. Even though you may be using this resource as well as others, use your own words in making the actual presentation. For effective and rewarding results, do what's comfortable for you.

Invite people to participate. The purpose of any toolbox talk is to get people to think about safety problems. Make the talk a hands-on session. Have your people name hazards and what to do about them. Encourage them to offer suggestions to improve safety. When asking questions, use open-ended questions instead of questions that require only a yes or no answer.

**The Topic**

Choose timely topics. Gear your talks to safety problems you are encountering at the moment or that you anticipate in upcoming jobs.

- Review recent injuries-
  - What happened?
  - Why did it happen?
  - What should have been done?

- Review recent safety violations-
  - What was the violation?
  - What hazard did it create?
  - What injury could have occurred?

- Review upcoming work schedule-
  - What hazards are you concerned about?
  - What safety equipment should be used?
  - What procedures should be followed?

**The Place and Time**

Hold the meeting in your work area. We recommend holding the meeting first thing in the morning or immediately after lunch when the workday will least be interrupted and the work area relatively quiet.

Hold a toolbox meeting once a week to reinforce your company" philosophy that job safety is important.

We hope our toolbox talks help you in the daily operations of your business. Keep them handy. Like any tool, they can" help unless you use them. If you have any questions, contact your EHS representative.

TOOLBOX TALKS
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TOOLBOX TALKS
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## CBS *INJURY AND ILLNESS PREVENTION PROGRAM*

### Appendix G: EMPLOYEE SAFETY TRAINING

**Location:** _____

**Date:** _____

**Conducted By:** _____

**Topic:** _____

_____

_____

**Attendees:**

| Name (Print) | Signature |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
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# Controlling Hazardous Energy

## How Lockout and Tagout Protect You

Machinery or equipment that starts up unexpectedly while someone is performing maintenance or repairs can be a serious safety hazard. New lockout and tagout rules are designed to protect workers from unexpected startup or release of stored energy that could cause injury. Although only authorized employees are permitted to perform lockout procedures and to remove locks and tags, all employees need to understand lockout and tagout procedures.

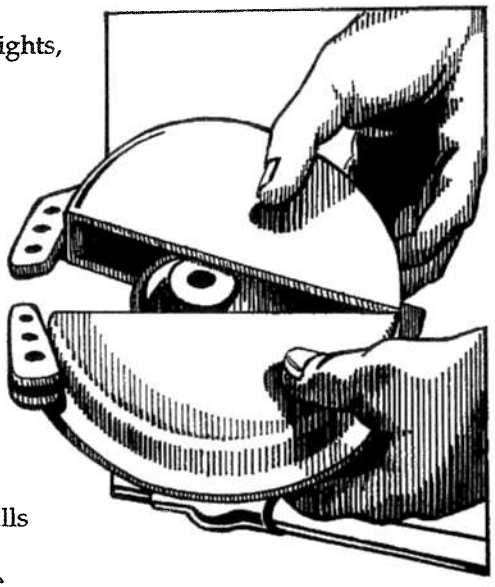
### Keeping Energy "Off"

Electricity, gas, hydraulic and pneumatic systems, raised weights, pressurized fluids or tightly coiled springs must be "neutralized" for safety during maintenance and repairs; that is, the power that operates the machine or equipment must be released or shut off. *Lockout* means putting a lock on a machine or piece of equipment to make sure it stays off. Lockout locks must meet special requirements and must be identified by the name of the worker who installs and removes them.

When equipment cannot be locked out, it must be "tagged out" with a special tag that warns other workers of the danger of starting up the machine. These tags must also meet special requirements and show the identity of the authorized employee.

### Restarting Equipment

After the work is completed, only the same authorized employee who installed the lock may remove it and restart the equipment. When restarting the equipment, make sure all other workers are a safe distance away, remove tools from the equipment, reinstall machine guards, restore energy and notify others that the machines are working and back on.

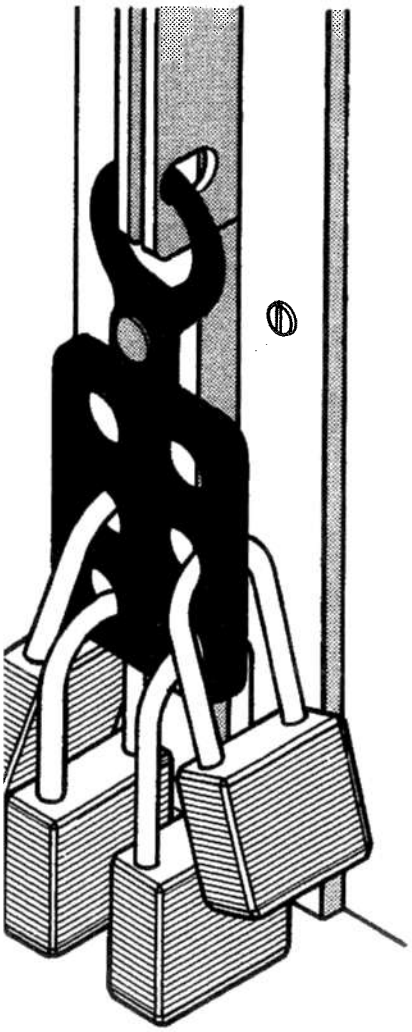


**Lockout devices are used to prevent startup, or the release of stored energy; they also secure valves when machinery or equipment is being maintained or repaired.**

## Take 8 Steps to Lock Out Hazards

1. Think, plan and check. If you are in charge, think through the entire procedure. Identify all parts of any systems that need to be shut down. Find the switches, valves or other devices that need to be locked out.
2. Communicate. Tell affected employees you'll be locking out the equipment and why.
3. Locate all power sources, including stored energy in springs or hydraulic systems.
4. Neutralize all power at its source. Disconnect electricity. Block movable parts. Release or block spring energy. Drain or bleed hydraulic and pneumatic lines. Lower suspended parts to rest positions.
5. Lock-out all power sources. Use a lock designed only for this purpose. Use a lockout tag that includes your name and the time, date and department.
6. Test operating controls. Turn on all controls to make sure the power doesn't go on.
7. Turn controls back to "off."
8. Perform necessary repairs or maintenance.

# First, De-Energize!



*Locking out power sources during maintenance or repair is a proven way to reduce accidents.*

Electrical shock, burns, amputations and death are some of the horrible consequences of not turning off electricity before equipment servicing or repair. Lockout/tagout procedures are a proven way to reduce accidents from unexpected equipment start-up. Although only authorized employees are permitted to perform lockout/tagout, to be safe, all employees must understand the procedures.

## Locks and Tags

Lockout refers to putting a special lock or other device on the equipment part that controls the energy. If a system can't be locked out, it must be tagged with a warning to other workers about the danger of starting the equipment. Both locks and tags must be marked with the name of the authorized employee performing the procedures.

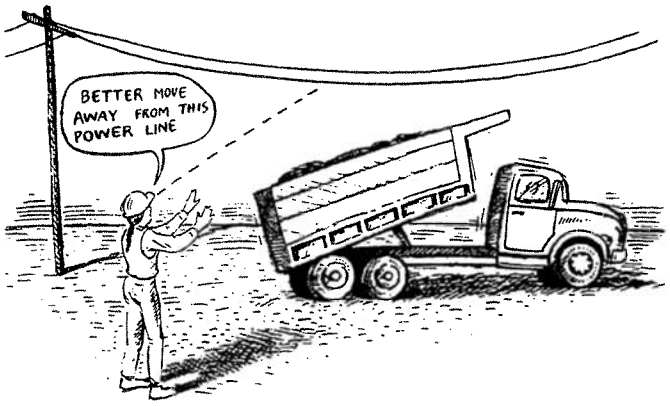
## Energy Control Steps

Electricity, stored electricity (such as in a capacitor), stored pressure (such as compressed air) and stored mechanical energy (such as a coiled spring) are all forms of energy that must be neutralized for safety during equipment maintenance and repairs. Take these steps to lock out hazards:

- Think, plan and check. If you are in charge, think through the entire procedure. Identify all parts of any systems that must be shut down. Find the switches, valves or other devices that need to be locked out.
- Communicate. Tell affected employees you'll be locking out the equipment and why.
- Locate all power sources, including stored energy in springs or hydraulic systems.
- Neutralize all power at its source. Disconnect electricity. Block movable parts. Release or block spring energy. Drain or bleed hydraulic and pneumatic lines. Lower suspended parts to rest positions.
- Lock out all power sources. Use a lock designed only for this purpose. If a tag is used instead, it should be placed where the lock would go.
- Test operating controls. Turn on all controls to make sure the power doesn't go on.
- Put controls back to "off."
- Perform necessary repairs or maintenance.
- Remove locks, restore energy and restart equipment ONLY after all other workers are a safe distance away, tools are removed from equipment, machine guards are reinstalled and other workers are notified that the machines are working and back on.

## Do Your Part

Whether or not you are authorized to perform lockout/tagout, you can do your part to ensure that maintenance and repairs of electrical equipment are conducted without accidents. Learn about and comply with your company's procedures and encourage co-workers to do the same.




*Survey the scene carefully to identify and avoid overhead electrical hazards.*

# Keep Your Distance

## *Working Near Overhead Power Lines*

An employee who positions a drilling rig crane or dump truck directly beneath a low power line may risk electrocution when the boom or truck bed is raised. A worker who climbs onto a tall truck bed to unfasten a load can be electrocuted instantly if he or she contacts a nearby power line. Accidents such as these involving overhead power lines are serious and usually result in severe burns or death. They also typically result from unsafe work practices and can be prevented.

### Look Before You Work

Your eyes are your best protection against the dangers posed by overhead power lines. Before you work outdoors, survey the scene carefully to identify and avoid overhead hazards. Estimate clearances from lines to the highest possible part of your vehicle or equipment.

### If You Must Work Beneath Power Lines:

- Follow your company's guidelines for safe clearances. (A minimum clearance is required by law.)
- If you need extra protection, contact the facility owner, who will install barriers or de-energize the line.
- Make sure workers standing on the ground do not touch vehicles or equipment. Electricity can pass quickly through a vehicle or other equipment and shock anyone in its path.
- If a vehicle or other equipment with the potential to contact overhead lines is grounded, make sure employees do not stand at or near the grounding location whenever there is a possibility of overhead line contact. Depending on the conditions underfoot, current could be transferred several feet outward from the grounding point.
- Be careful when handling long, conductive materials, such as pipes and metal rods. Use ladders with nonconductive rails.

### If a Live Wire Falls

Electricity from a downed wire will use you to get to the ground if you come in contact with it. If a live power line falls, stay away from it and call for help. If the line hits your vehicle, stay inside. If there is a fire, then jump out, being sure not to touch the vehicle and the ground at the same time.

### Be Aware

Be aware of the hazards of overhead power lines and keep your distance to avoid deadly mistakes!

# Working Sensibly With Electricity

Electrical accidents cause thousands of injuries and deaths in industry every year. Unsafe working conditions and unsafe acts are the underlying causes of all of these accidents. Learn to spot, correct and prevent these culprits and you'll make your workplace safer.

## Correct Unsafe Conditions

Unsafe working conditions result from faulty equipment or hazards in the environment. Equipment with defective insulation or parts, improper grounding, loose connections or unguarded energized parts is just plain dangerous to work with. Environments containing flammable vapors, liquids or gases; corrosive chemicals; and wet or damp locations can also be dangerous when electrical equipment is in use. Take action to correct these hazards:

- Always check equipment, cords and attachments before each use.
- Make sure all equipment is properly grounded and plugged into grounded circuits.
- Never modify or remove a guard. Guards protect you from energized equipment parts.
- Be aware of flammable or corrosive chemicals, and follow your company's procedures for operating electrical equipment in their vicinity.

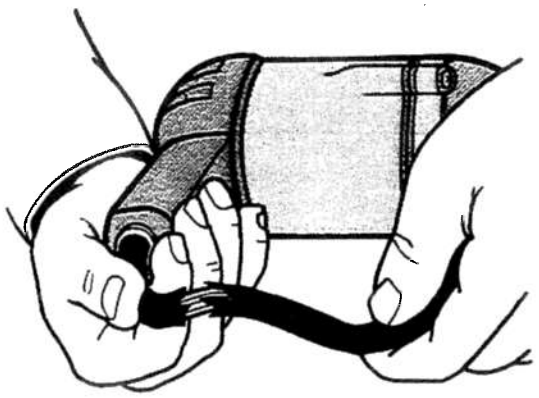
## Prevent Unsafe Acts

The most common unsafe acts include using tools or equipment too close to energized parts, intentionally using tools that are obviously defective or unsafe, and failing to shut off electrical equipment for repairs, servicing or inspections. Don't be a victim of unsafe acts:

- Keep clear of energized parts. Be aware of the conductive materials and tools around you, and keep them far from sources of electricity. Remember, steel wool, metallic cleaning cloths and some chemical solutions are conductive.
- Never use equipment that you know is damaged. No shortcut is worth an electrical shock. Report any damaged insulation or loose parts or connections that you find.
- Be aware of your company's lockout/tagout procedures to ensure that equipment is turned off—and stays off—during maintenance and repairs.
- If you must work with energized parts and lockout/tagout is not possible, always use protective equipment, such as rubber gloves, sleeves, blankets and mats, or nonconducting tools rated for the voltage of the parts. Make sure this equipment is maintained so that it does its job.
- Avoid using electrical equipment when you or the equipment are wet. If you must work in damp areas, use a ground fault circuit interrupter (GFCI).

## Keep Electricity Working for You

Electricity is a powerful ally in the workplace, but it should never be taken for granted. By exercising caution and common sense, you can keep electricity working for you, not against you.

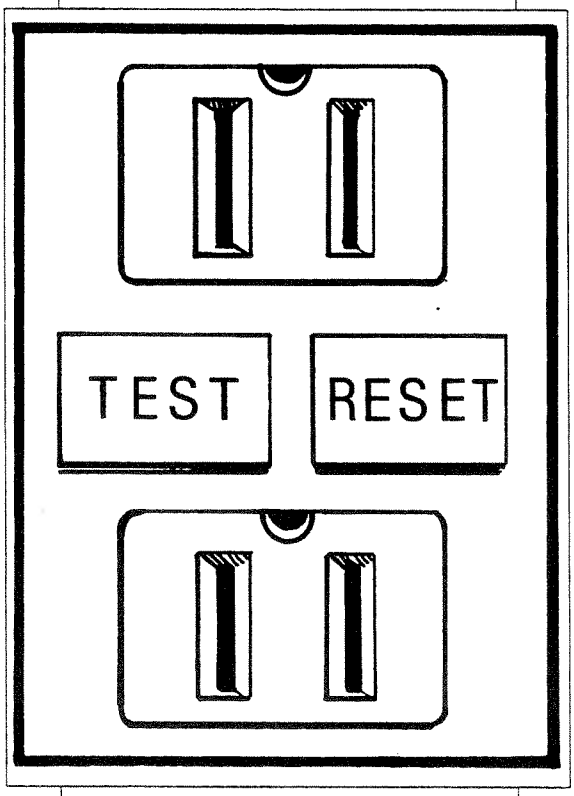


*Get in the habit of checking equipment, cords and attachments before each use, and never use equipment that you know is damaged.*

# The Importance of Electrical Grounding

Modern construction wouldn't be possible without electricity. But electricity can be a killer if it's not used safely. The most important thing you can do to insure your safety around electricity is to properly ground all electrical tools and equipment. Let's talk about what electrical grounding is.

When there's a current leakage from a tool or piece of equipment, the current will flow through any available conductor until it reaches the ground. Since your body is in contact with that tool, the available conductor is you, unless the tool is grounded. What happens when electrical current uses your body to ground itself? The response ranges from a slight tingle to sudden death. Electricity causes muscles to contract, often making it impossible for the affected person to let go of the tool. Severe electrical shock causes the heart muscle to contract and stop beating. Contact with a circuit can also cause blisters and burns.




To prevent ground fault hazards, all electrical tools should be connected by a three-pronged grounded plug.

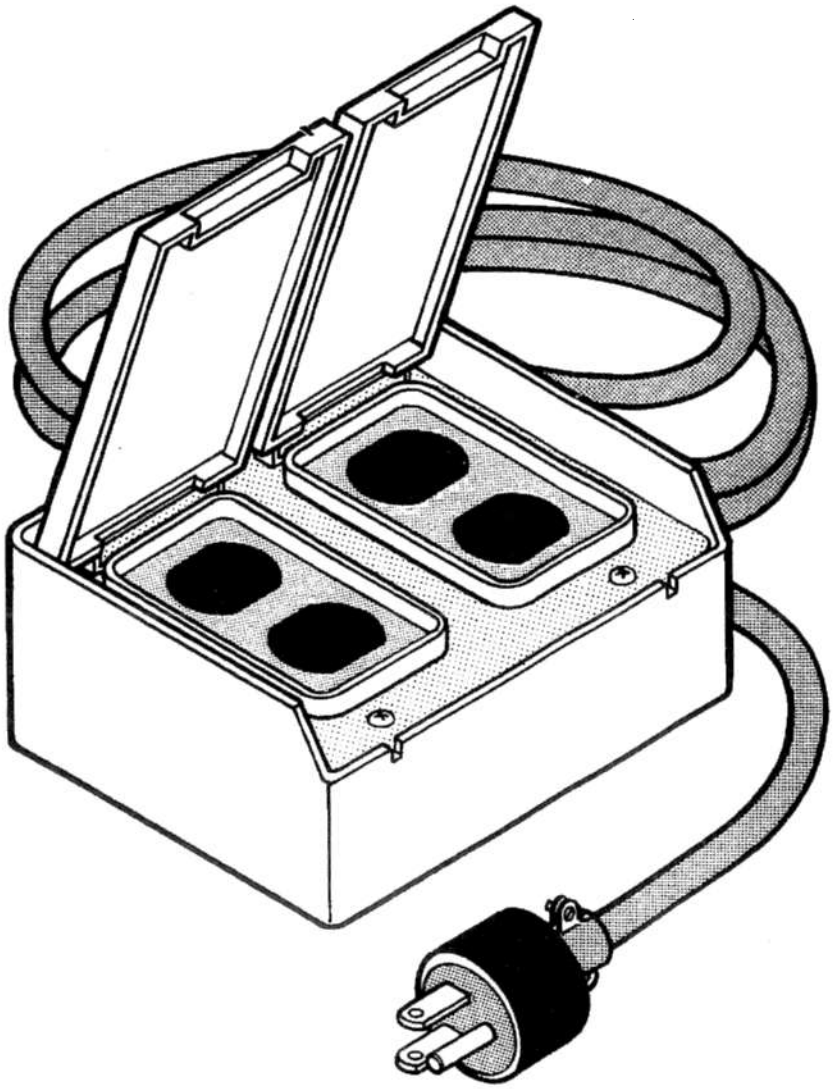
If grounding is not available, always use double insulated tools, which are covered with a nonconducting surface to protect you from contact with the circuit. Or use battery-operated tools. Another device, a ground fault circuit interrupter, is required on many outdoor construction sites. It shuts off electricity if a ground fault occurs.

You can't count on being safe around low voltages. Under the right circumstances, even low voltages can kill. Your body's "resistance" to current depends on a number of things, most importantly, how damp your skin is. Everyone's skin has some moisture in it. The more moisture, the more current flows through you. That's why you are in greater danger of electrical injury when you're working in damp weather or are sweating.

If someone else has come in contact with a circuit, the first thing to do is to break the circuit by disconnecting the electrical supply. Never touch a person who is in contact with a live circuit.

The more you understand about electrical grounding, the less likely you are to suffer an injury. Take the time to make sure your tools and equipment are properly grounded or insulated. Being careless or hasty with electricity can lead to a shocking experience.

# Ground Fault Circuit Interrupters



Power tools can easily cause shocks, burns and fires if they are not in good working condition, if insulation is inadequate or if they come in contact with water or moisture. A ground fault circuit interrupter (GFCI) provides extra shock protection when you work with portable power tools, especially in damp areas or outside. A GFCI protects you by shutting off electricity if a ground fault occurs.

## Your Second-Line Defense

Make sure your power tools are double-insulated and that the outlets you use are grounded. However, these measures may not be enough to protect you against the hazards of working in damp areas and the risk of damaging or cutting a power cord while in use. A GFCI is your best second-line defense against these common electrical shock hazards. GFCIs are mandatory on construction and other outdoor sites.

## How the GFCI Works

The GFCI is a fast-acting circuit breaker. It senses small imbalances in a circuit caused by current leakage and, in as little as 1/40 of a second, shuts off electricity. A GFCI protects against fires, overheating and destruction of wire insulation. However, it will not protect you from line-to-line contact hazards, such as direct contact with two live wires.

## Where to Install a GFCI

Install GFCI outlets where power tools are used, or wherever electrical equipment is used near water or dampness, such as outdoors. GFCIs can be wired into circuits at a panel box or used to replace ordinary outlets. They can be a lifesaver!

*Ground Fault Circuit Interrupters are a must when working in high-risk areas where moisture and liquids present a hazard.*

*Although instinct may tell you to grab at someone who is being shocked to remove them from the source of current, this type of hasty action could cost you your life. Turn off the power first, or use a nonconducting tool such as rope or dry wooden stick to move the person.*

# Responding to Electrical Emergencies

Prompt action in an electrical emergency can save lives. But a hasty, haphazard response can do more harm than good. Becoming familiar with the following response procedures will make it easier for you to think clearly and act decisively if an emergency occurs.

## Shock and Electrocution

Shock victims must be removed immediately from the source of electricity. To protect yourself from shock, turn off the power before touching the victim, wire or equipment. If you can't turn the power off, use a nonconducting tool, such as a rope or wooden stick, to move the person, then call for help. Make sure you don't complete a circuit between two wires or between one wire and the ground. If the victim is touching a power line, stay clear and call for help.

Before giving any other treatment, check the victim's breathing and pulse. If breathing has stopped, give artificial respiration. If you don't detect a heartbeat, CPR must be started immediately. After four to six minutes, oxygen deprivation will cause brain damage. Continue CPR until medical help arrives or until the victim begins to breathe on his or her own.

## Fires

Small electrical fires can be put out with a Class C or combination fire extinguisher. Never use water on an electrical fire. If the fire appears to be growing rapidly, or if it is already too large or too smoky to use an extinguisher, follow your company's plan for evacuation. Stay low to avoid smoke inhalation and encourage others to do the same. If anyone's clothing catches fire, force him or her to stop, drop and roll to extinguish the flames.

## Burns

Burns suffered in electrical accidents may affect the skin, muscles and bones. The first hour is crucial for treating burns. Treat a minor burn with cool water, then cover with a clean, dry cloth. Never use ointment, ice or butter on a burn. Serious burns require immediate medical attention. Cover the affected area with a sterile, dry cloth and call for medical help. The victim may go into shock. Keep him or her lying down with feet elevated until help arrives. Never try to pull charred clothing off burned skin.

## Stop, Notice and Think

No matter what type of electrical emergency confronts you, always stop to notice what's going on and think about a safe plan of action. Although instinct may move you to grab at someone who is being shocked to remove him or her from the source of current, this type of hasty action could cost you your life. Instead, first turn off the power. Before treating a victim with first aid, consider whether you know what to do for the injury at hand. If not, get medical help immediately. Thoughtful action is the best strategy for any electrical emergency.

## Special Note

Give CPR only if you've been trained to do so. If you are not trained in CPR, call for someone who has been trained.

# It's Shocking

## *How Electricity Reacts With Your Body*

Electrical shock kills more than 100 workers each year and injures many more. A heavy electrical shock can stun your muscles and nerves and stop your heart and breathing. A milder shock can cause you to fall, resulting in bruises or broken bones. Knowing how shocks happen can help you protect yourself on the job.

### How Shock Occurs

Electricity follows the easiest path to the ground. It will flow through any conductive material, such as water, metal, certain chemical solutions or the human body. If you come in contact with electricity while you are in contact with the ground, you become part of an electrical circuit, and current passes through your body, causing a shock.

### Effects on the Body

The effects of an electrical shock depend on the type of circuit, its voltage, the pathway through the body and the duration of contact. Depending on these factors, an electrical shock may cause respiratory or muscular paralysis. Even a small shock can kill you if it passes through your heart and lungs. If a current does not pass through vital organs or nerve centers, severe injuries such as deep internal burns can still occur. Other effects include involuntary muscular reaction, which may cause falls resulting in bruises, bone fractures, or death.

### Safe Equipment

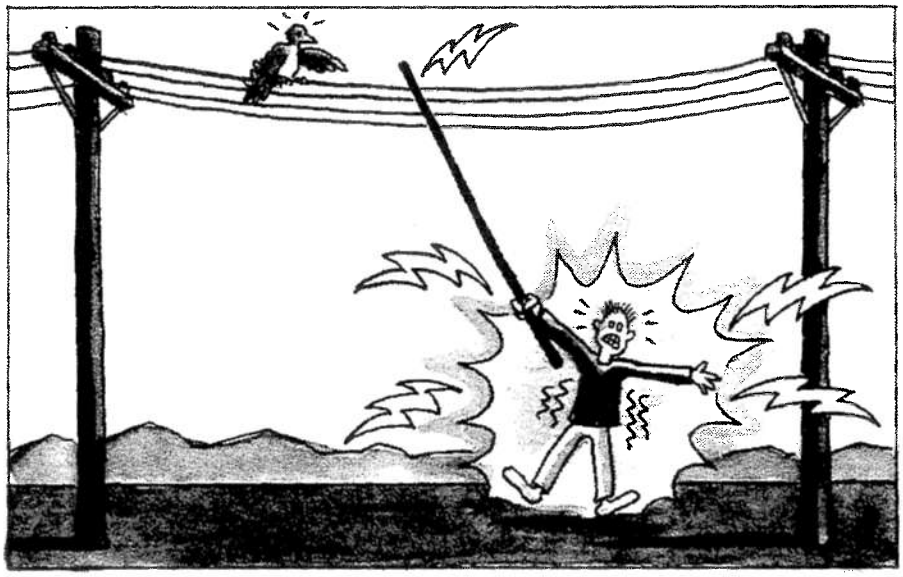
Equipment in your workplace is designed to protect you against electrical shock. Insulation, such as the material around tool and equipment cords, provides a barrier to electrical current. To be effective, cord insulation must be appropriate for the voltage and kept undamaged, clean and dry. Guards, which are some type of physical barrier, keep you from contacting energized equipment parts. Fuses, circuit breakers and ground fault circuit interrupters (GFCIs) cut off power if a circuit overload or short circuit occurs.

### Safe Work Habits

Because even the best equipment protection is not fail-safe, safe work practices are equally important for preventing elecrical shock. Keep a prescribed distance from exposed energized wires or parts, and avoid using electrical equipment when you or the equipment are wet. Lock out or tag equipment that is de-energized for maintenance or repair. Always use grounded tools with circuits that are equipped with proper grounding or other protection. And use protective clothing and devices, such as rubber gloves, safety mats or special tools, when required.

### Protect Yourself and Others

Do your part to make sure your workplace has safe equipment—and use that equipment safely—to protect against the hazards of electrical shock.



*Electricity tries to find the easiest path to the ground. Because the bird is not touching the ground while it is sitting on the power line, it receives no shock. But the man is standing on the ground when the metal pole he is holding touches the power line. He has become part of an electrical circuit, and the electricity will flow through him to the ground.*

# Understand Conductivity

*It Could Save Your Life*

Many electrical accidents occur when workers come in contact with electrical current—either directly or through conductive materials or equipment. Working safely around electricity requires a basic understanding of conductive materials and the methods used to isolate them from electrical contact.

## Conductors: Electricity's Pathways

Electricity always follows the easiest path to the ground. It will travel there through any conductive material, such as water, metal, some chemical solutions or the human body. If you come in contact with live electrical parts or wires—either through direct touch or via a conductor—electric current will pass through your body on its way to the ground, delivering a shock and, possibly, severe burns or death.

## Is It a Conductor?

Whenever you work around electrical equipment, make it a habit to identify all conductors that could come in contact with electricity. Metal tools, pipes, ladders, steel wool and certain chemical solutions are a few common conductors. Your own body is 70% water, making it highly conductive. Your body's conductivity increases if your hands are wet or you are perspiring heavily. Metal jewelry and headgear are also conductive and should not be worn if they might contact energized parts of equipment.

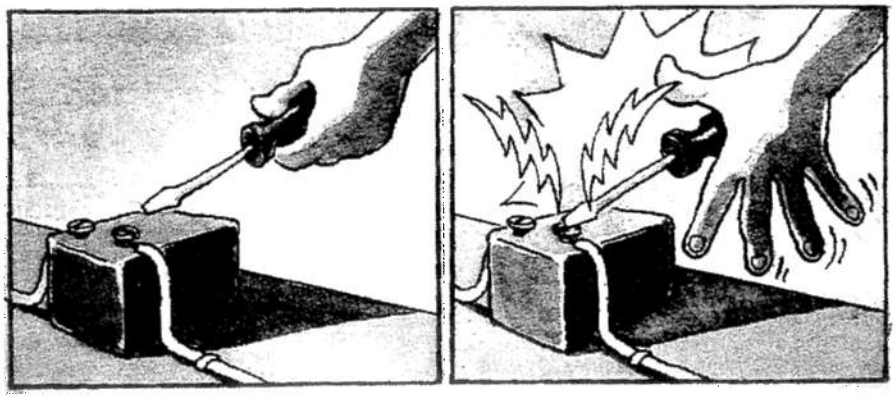
## Workplace Protection

Various protections exist in your workplace to prevent your body from becoming a conductor of electricity:

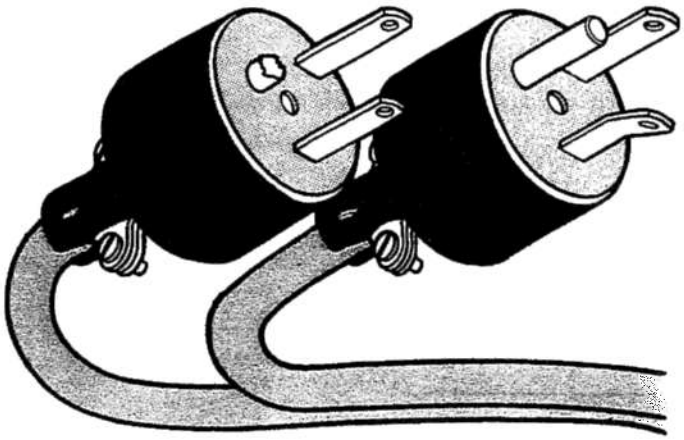
- Insulation, which covers electrical wires and encloses live parts of some equipment, provides a barrier to the flow of electical current. To be effective, insulation must be adequate for the voltage, undamaged, clean and dry. Special heavy-duty rubber mats may also be used to insulate workers around electrical equipment.
- Guarding prevents your body from coming too close to energized parts. It may take the form of a physical barrier or may be achieved by installing live parts out of reach. Never remove or modify a guard—it is there for your protection.
- Lockout/tagout procedures, which enforce the shutoff of all energized parts during equipment maintenance or repairs, also protect workers from accidental contact with live electrical parts. Only authorized employees can perform these procedures, but all employees should understand them.
- Safe housekeeping is essential. Where live parts present an electrical contact hazard and shutoff is not possible, do not perform cleaning or maintenance tasks unless you have insulating equipment or barriers. Many cleaning materials, including metallic cloth and certain chemical solutions, are highly conductive.

## Keep Out of Electricity's Way

If given the chance, electricity will use your body as the easiest route to the ground. Don't let it! Keep yourself—and the conductive materials you work with—out of electricity's way.



*If given the chance, electricity will use your body as the easiest route to the ground. De-energize equipment or use proper insulation or guards to protect yourself from electrical shock.*



*Before use, inspect all electrical equipment and cords for defects. Use equipment only if it's in good condition.*

# Portable Electrical Equipment

When you use portable electrical equipment, you are exposed to voltages with the potential to injure and even kill. Faulty wiring, improper grounding and misuse of electrical outlets and plugs are just some of the hazards that may cause serious shocks and burns. Take the following precautions to avoid these and other electrical hazards.

## Grounding

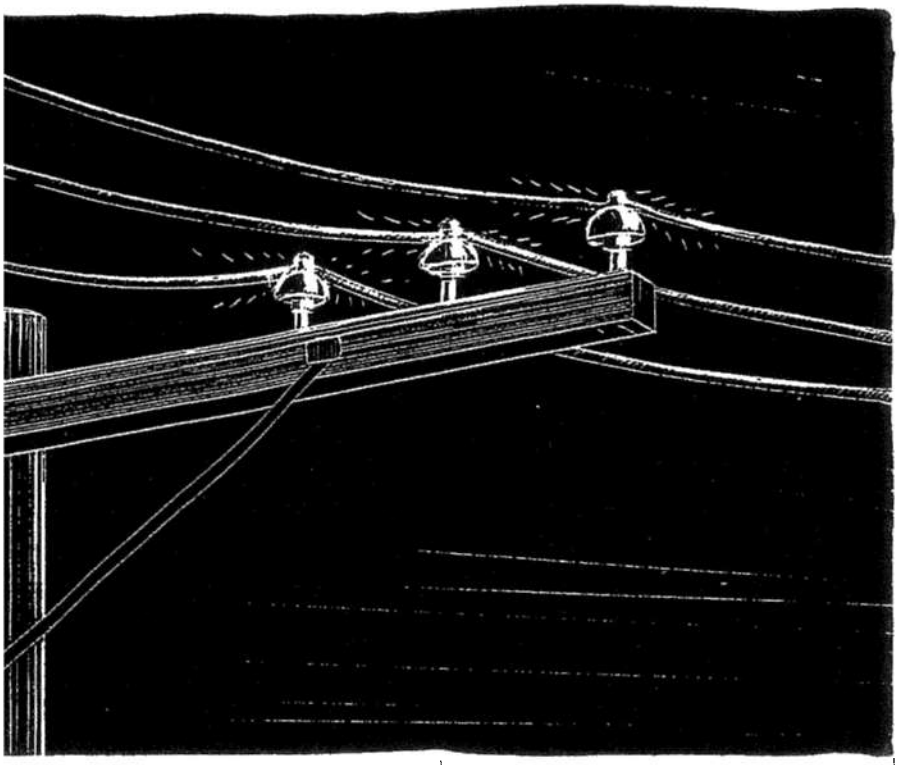
Grounding is one of the most important safety measures you can take whenever you work with electricity. If faulty circuits or equipment allow current leakage, electricity will flow to the ground along the path of least resistance. Grounding ensures you don't become that path by providing an alternate route to the ground. Make sure all electrical equipment is properly grounded, and plug power tools into grounded outlets installed with ground fault circuit interrupters (GFCIs). Check ground connections regularly for tightness.

## Whenever You Work with Electricity

Follow these important rules to make electrical safety one of your work habits:

- Before use, inspect all electrical equipment, cords and outlets for defects. Use only equipment that is in good condition. Report unsafe conditions, such as defective cord insulation, poor connections to terminals, broken switches or plugs, sparking or overheating equipment, or outlets without GFCIs in damp areas.
- Start and end from "off." Make sure the power switch is off before plugging in equipment. When you are finished, turn the equipment off before unplugging it to protect yourself and the next user.
- Don't kink, cut or crush any electrical cord. Never carry equipment by its cord.
- If equipment has a three-prong plug, use a three-slot outlet or extension cord. Never modify three prongs to fit two slots by removing the third prong. Use an adapter instead, making sure that the metal grounding piece on the adapter is connected to a grounded object, such as the screw on the receptacle cover plate.
- Keep water and electricity far apart. Don't use electrical equipment when your hands are wet or any part of you is touching water. If you must work in damp areas, use a GFCI.
- Don't strain equipment. Service equipment regularly and repair or replace as needed. Disconnect power for inspections, servicing or changing accessories.

# Cranes and Power Lines Don't Mix



Operating a crane would be a lot easier if we never had to worry about power lines. Power lines are a fact of life at most work sites. let's review the special hazards of using cranes around them and the precautions you must take to protect yourself and your coworkers. The keys to safe crane operation are following procedures exactly, staying alert, and using good judgment.

The safest way to work around power lines is to have the current shut off during the job. If the current must remain on, be sure you understand all procedures before you begin working in these dangerous conditions. If in doubt, ask. Remember, there are no stupid questions, only stupid mistakes (and sometimes dangerous ones). Be sure you are thoroughly familiar with the operation of your vehicle. Know the length of the boom and the arc it makes when it is raised and lowered.

Staying alert includes constantly remembering those power lines as you work. This is not the time to plan your vacation or rehash that argument with your brother-in-law. Forgetting that you are near a power line can be a fatal mistake. Keep your mind focused on what you are doing and be alert to changes in your surroundings, especially those surroundings near the top of the crane. Make repeated visual checks of your position in relation to power lines. It's easy to get so absorbed in your work that you don't notice what's around you.

Use good judgment when positioning and lowering the boom. Avoid taking chances because you're "sure" it will clear. Crew members and crane operators must work together, with the crew member able to clearly signal the operator if the boom is too close to a power line. Good judgment and teamwork are a must when you move the crane with the boom in the air.

One more point: to stay alert and use good judgment on the job, you need to come to work in good shape. Get plenty of rest and a good meal before starting work. You owe it to those who depend on you.

If you've worked in heavy construction a long time you probably know of someone who has died or been severely injured in a power line accident. The real tragedy is that most of these accidents were the result of poor judgment or forgetfulness. Do your part to prevent needless tragedy: know your equipment and safe operating procedures before you begin, keep your mind on your job, and remember: power lines and cranes don't mix.

# KNOW THE DANGERS OF CONFINED SPACES

*Confined spaces can be highly dangerous areas. Their hazards are often invisible, fast-working and difficult to escape. Even empty, well-cleaned spaces can pose risks. Know the dangers of confined spaces so that you can avoid them.*

## Hard to Enter . . . and Exit

Confined spaces have few or very small openings and are difficult to enter and exit. They're not designed to be work areas, so ventilation is usually poor. Confined spaces can be small, like crawl spaces, bins and manholes, or large, like boilers, storage tanks and pipelines.

## Major Dangers

There are four major dangers in a confined space. First, there may not be enough oxygen to breathe. Chemicals or gases may consume oxygen or displace it. Even if there is enough oxygen when you enter, it can be used up quickly just by your breathing and your work.

Second, fires and explosions can happen more easily in a confined space. Cigarettes, static electricity, sparks or heat can ignite invisible vapors and gases. Fires and explosions are dangerous in themselves and can also use up oxygen so quickly that they prevent escape.

Third, toxics in the air can harm your respiratory and nervous systems. Often, you cannot see or smell toxics, and by the time you feel their effects, it may be too late.

Last, physical dangers such as entanglement or sinking into loose material, or from moving parts such as agitators or blenders, can suffocate or crush you. Loud noise, intense heat and falls can also be dangerous.

## Tips for Safe Entry and Work

Confined spaces at your workplace should be identified to prevent accidental entry, and workers who must enter them should receive special training and obtain an entry permit. If you work in confined spaces, use these precautions:

- Ask a qualified person to test the air inside for oxygen, flammability and toxicity. Test high, low and in corners where gases might collect. Continue to test at frequent intervals while working in the space.
- Always prepare before entering a confined space. Use the appropriate personal protective equipment (PPE), including the right respirator. Make sure all equipment is tested and grounded. Know the hazards that might exist in the space and how to recognize symptoms of overexposure.
- Cut off gas, power, steam or water lines to the space before entering. Follow lockout/tagout procedures to protect against accidental equipment start-up and to alert co-workers.
- Have at least one trained, equipped buddy outside to rescue you in case of trouble. Decide how to stay in communication so that your buddy knows you're okay.
- Wear a lifeline and harness in case you require assistance or rescue—a rope is not enough.
- Remove all potential causes of explosion or fire. Use spark-proof tools and explosion-proof fans, lights and air movers. Never smoke!
- Work as fast and safely as possible. Know how to exit the space quickly, without assistance.
- If a co-worker must be rescued from a confined space, never go in after him or her. A majority of confined-space fatalities are would-be rescuers. Instead, use rescue equipment and call trained rescuers for help.

**If a co-worker needs to be rescued from a confined space, never go in after him or her. A majority of confined space fatalities are would-be rescuers. Instead, use rescue equipment and call trained rescuers for help.**

## Play It Safe

Confined spaces can be dangerous areas. But they don't have to be deadly—if you understand the risks and use safety precautions.

# Standing By at a Confined Space

## *Your Role Is Safety*

*Whenever workers enter a confined space, at least one person should remain outside as a buddy, ready to help in case of trouble. A well-equipped buddy can make a dangerous job safer and, in some cases, can save lives. If you're a buddy, you should know how to keep a confined space a safe place, how to recognize hazards and what to do in an emergency.*

**When you are standing by while co-workers are in a confined space, wear proper PPE, stay alert and stay in touch with the people inside.**

### Prepare for Safety

Wear the same type of personal protective equipment (PPE) worn by the confined-space workers, including the appropriate respirator. Make sure each worker wears a lifeline or harness, which you can use to pull him or her out of the space. A rope tied around a worker's waist is not enough—you can't use it effectively in case of injury or lack of consciousness.

Know how to use communications equipment to keep in continuous contact with workers and to order evacuation or rescue procedures. Also know in advance the procedures for summoning emergency rescue services. Be sure a third person is nearby to help if necessary.

Stay on duty. Don't leave your post for any reason unless an equally qualified buddy replaces you. If you have to leave and no replacement is available, order workers to leave the space.

### Recognize Hazards

Be aware of potential hazards within the confined space, such as lack of oxygen, toxics, fires, explosions or physical dangers. Know how to identify materials that are—or once were—there. Be alert to any changes in conditions, or in a worker's behavior, that might indicate exposure to hazards. If you notice workers complaining of or demonstrating dizziness, confusion, drowsiness or difficulty breathing, or if they fail to answer a communication, start rescue procedures at once. Unauthorized people who come near or enter the space can also pose a hazard; keep them away. If they do enter the confined space, inform workers inside.

### Rescue!

If rescue is necessary, never enter the space yourself. Chances are high that you could be injured or killed before completing a rescue. In fact, more than 60% of confined-space fatalities occur among would-be rescuers. Be familiar with your company's rescue plan, use appropriate rescue equipment and contact designated rescuers or emergency personnel.

### Be Effective

An effective buddy can mean the difference between life and death for workers in a confined space. When your role is safety, play it well!

# TOOL BOX TALKS
## How To Give A Tool Box Talk

Communication is one of the best ways to prevent accidents. And one of the best ways of communicating the importance of safety on a construction job is through toolbox talks. You don't have to be a professional speaker to give a good toolbox talk. But there are ways you can make your talks more effective. Let's take a look at them.

**The Agenda**

Know your topic and plan your agenda a few days before the meeting so you're well prepared. (Be able to present the talk without reading it and lead a discussion afterward.) Wherever possible use actual equipment to illustrate your points. Coordinate hand-out literature or other material you intend to use at the meeting.

Limit the length of your presentation. Given your operation, you would be the best judge of how much time to set aside. Generally speaking, a half-hour is adequate. Allow for questions and answers afterwards-about 15 minutes.

Use visual examples. There's something to be said for "Seeing is believing." ff you're talking about ladders, have one handy so that you can point out such things as loose rungs or split side rails. If you plan to talk about the danger of using patched up hand tools, show a few samples. Consider a chisel with a mushroomed head; a hammer with a taped handle.

Do a wrap-up. Reinforce the important points brought out during the meeting. Thank your staff for their interest and enthusiasm.

**The Format**

Staff the meeting out on a positive note. After welcoming your staff, promote team work and how toolbox meetings not only provide valuable information but give everyone the opportunity to get together and exchange ideas. Be sure to compliment a job well done. Morale plays a bigger part than people think in affecting productivity and job satisfaction.

Keep it informal. Even though you may be using this resource as well as others, use your own words in making the actual presentation. For effective and rewarding results, do what's comfortable for you.

Invite people to participate. The purpose of any toolbox talk is to get people to think about safety problems. Make the talk a hands-on session. Have your people name hazards and what to do about them. Encourage them to offer suggestions to improve safety. When asking questions, use open-ended questions instead of questions that require only a yes or no answer.

**The Topic**

Choose timely topics. Gear your talks to safety problems you are encountering at the moment or that you anticipate in upcoming jobs.

- Review recent injuries-
  - What happened?
  - Why did it happen?
  - What should have been done?

- Review recent safety violations-
  - What was the violation?
  - What hazard did it create?
  - What injury could have occurred?

- Review upcoming work schedule-
  - What hazards are you concerned about?
  - What safety equipment should be used?
  - What procedures should be followed?

**The Place and Time**

Hold the meeting in your work area. We recommend holding the meeting first thing in the morning or immediately after lunch when the workday will least be interrupted and the work area relatively quiet.

Hold a toolbox meeting once a week to reinforce your company" philosophy that job safety is important.

We hope our toolbox talks help you in the daily operations of your business. Keep them handy. Like any tool, they can" help unless you use them. If you have any questions, contact your EHS representative.

TOOLBOX TALKS
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TOOLBOX TALKS
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## CBS *INJURY AND ILLNESS PREVENTION PROGRAM*

### Appendix G: EMPLOYEE SAFETY TRAINING

**Location:** _____

**Date:** _____

**Conducted By:** _____

**Topic:** _____

_____

_____

**Attendees:**

| Name (Print) | Signature |
|---|---|
| _____ | _____ |
| _____ | _____ |
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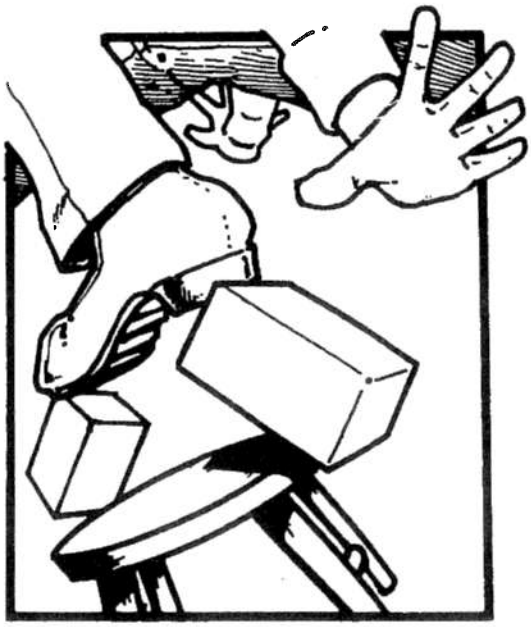
# No Substitute for Safety

It happens all the time. You need to get something done, and the tool or equipment isn't available. This is where a little creativity with substitutes can save you time and energy—or it can get you into big trouble. Before you use a "make-do," stop and think. Is the substitute really going to save you that much time? Is it really a safe replacement for the right piece of equipment?



For instance, on a construction site, a favorite substitute for almost anything is a cinder block. You can always depend on cinder blocks—to break at the wrong time. Everyone has a story about cinder blocks. There was the pipefitter who was trying to set up a scaffold in a stairway. Cinder blocks under two legs of the scaffold made it fit perfectly. The scaffold was just right—until one of the cinder blocks shattered and dumped him and the scaffold down the stairs. Putting cinder blocks under heavy equipment is an invitation to crushed toes when the blocks give way. Cinder blocks may make great bookshelves, but you can't trust them on the job.

Need another scaffold plank? Resist the impulse to visit the scrap lumber pile or use lumber intended for another purpose. Scaffold planks should meet strict specifications and be tested before they are used.

You use many tools in the course of your work day. It's your job to know which tool is right for which task. Always take the time to properly set up and use tools the way they were intended, even if it means setting up a special tool for a small job. And the same goes for protective equipment. Use the right eye protection for the job you're doing, not whatever goggles are in your apron pocket or on loan from your buddy. If you work around loud noise, cotton wads or other materials are no substitute for approved earplugs or earmuffs.

Most of the time the best rule for substitutes is to stay away from them. If you want to be creative, take an art class in your spare time. But if you must use a substitute, a good rule to follow is to make sure it's stronger and safer than whatever it's replacing.

# Accidents Cost Everyone

When someone you work with is injured on the job, it doesn't really affect you. Or does it? You might be surprised at the ripple effect an accident can cause. Every accident has costs, and the costs always include more than money.

For instance, accidents directly affect a company's productivity. Obviously, a company that is producing less can't compete with companies that have higher production. If the company loses business because frequent accidents lowered productivity, that means less money for wages and benefits. People may even get laid off.

Thank goodness Workers' Compensation insurance covers the medical expenses of those injured in accidents. But someone has to pay for the insurance. A company with a high accident record must pay higher insurance premiums. The more money spent on those premiums, the less that's available for other things—like your paycheck.

When there's a serious accident on a site, such as a fire or explosion, you may be out of work while the damage is being repaired. And many badly damaged worksites frequently shut down permanently or are taken over by other companies. People out of work temporarily or permanently because of an

accident may have trouble making the mortgage or rent payments. Some become homeless. Others may need to dip into their savings or postpone buying a home or moving into a larger apartment. The stress of economic hardship takes its toll on the families of all workers.

When accidents happen frequently in a work environment, everyone feels stressed. You can't be performing at your peak when you are worried about your safety and health. And when trusted coworkers lose their jobs and their hopes because of a permanent disability, everyone suffers an emotional loss. Finally, accidents in your work area reflect a poor work record.

You can see that accidents at your work site can affect you in many ways. That's why it's worth it to take the time and care to use the right equipment and procedures, wear the right protective equipment and follow safe work practices. It's also important to be alert to the safety needs of those you work with. When accidents are prevented, everyone gains.

# Beware of Those Sharp-Pointed Objects

Part of your on-the-job safety procedure is to protect yourself from the hazards of your work by using safety goggles, face shields, gloves, and the like. You need to protect your hands and feet from the possibility of a puncture wound from a sharp object such as a nail. You should know two things about puncture wounds: how to prevent them and what to do if you get one.

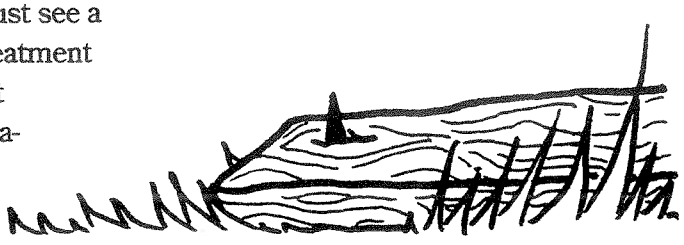
The best way to protect yourself is to keep a clean work environment. This means removing nails from wood immediately when braces, guard rails, forms, and the like are dismantled. Move scrap lumber that may contain nails to a scrap heap away from pathways in the work area. Nails alone can be a hazard. They often land point up in mud, weeds, debris, or on bare ground if they have wide heads. Keep the work area clean of dust and other things that might "hide" nails, so you can spot them more easily. Be especially careful about areas at the base of ladders or other places where you or others might step down backwards.

In addition to keeping a clean work site, be extra careful using power tools that drive nails, staples, or punches, and follow recommended precautions when using them.

No matter how careful you are, you or someone else on the job may get a puncture wound. Always treat a puncture wound with special care, even if it doesn't seem to hurt very much. The reason for this is simple: the point of the sharp object carries bacteria deep into the flesh where antiseptics can't reach. The surface of the wound may heal while an infection is developing underneath. Report a puncture wound at once and thoroughly treat it. Then keep an eye on it. If the wound doesn't seem to be healing or if there is reddening, swelling, or increased pain, you may be developing an infection. If this happens you must see a doctor to get treatment that will prevent serious complications. Anyone who works around sharp objects should also have a tetanus booster every five to ten years to prevent tetanus, an even more serious puncture wound complication.

*Always treat a puncture wound with special care, even if it doesn't seem to hurt very much. The reason for this is simple: the point of the sharp object carries bacteria deep into the flesh where antiseptics can't reach. The surface of the wound may heal while an infection is developing underneath.*

Good safety practices and prompt first aid are important to protect you from any job related injury. But you must take special care to both prevent and treat puncture wounds, because they can be deadly. Like so many safety programs, preventing puncture wounds mostly boils down to simple good housekeeping.



# Always Be On The Lookout

Think about the last accident that happened at work. Chances are it happened because somebody wasn't looking out. Keeping your eyes open to what's going on around you is a key to preventing construction site accidents.

If only people and things on a site would stay put, this talk wouldn't be necessary. But let's face it. Most construction sites are like Grand Central Station, with people, vehicles, machines, and hoisting equipment constantly moving around, both on the ground and in the air. To protect yourself and those around you, keep a constant lookout—not just in front of you, but behind, around, above, and below.

Watch for moving objects. This includes trucks, hoists, and machinery. It would be a lovely world if the drivers of this equipment were looking out just for your welfare. Since you can't depend on them, assume they don't see you until you know they do. Be extra aware when sitting or crouching down behind vehicles that might back up. By the same token, if you're the driver, look out for people who may not expect you to be coming through.

Look out below—and above. Look before dropping anything to the ground from ladders, scaffolds, or second stories. Look below you as you climb down a ladder. Stay away from swinging loads and from areas where debris is being lowered. If it is necessary to work in these areas, make sure those above you know you're there. And look up often to keep track of the movements above you.

Watch your step. On a construction site, your next step could be into an open stairwell, off the edge of an unfinished platform, through a false ceiling or temporary covering, or into the path of a moving truck. Keep your eyes on the path ahead of you so you won't trip on the pile of lumber that wasn't there the last time you walked by.

In order to "look" your best, make it easy for your eyes to do their job. Use proper eye protection and keep your eyewear clean and scratch-free. If you need glasses, wear them at all times. Make sure they are either prescription safety glasses or protected by safety goggles.

Keep these points in mind and you will never have to be in the sorry position of saying "I didn't see," when what you really mean is "I wasn't looking."

# Good Housekeeping Makes A Difference

Let's talk about housekeeping—not the kind you do at home, but right here on the job. What difference does good housekeeping on the site make to you? A big difference—your safety, how much work you get done, and whether or not the job gets finished on schedule all depend on good housekeeping.

Keeping an orderly work site saves time. When you have to walk around job litter 50 times a day, you waste your time and the company's. It takes time to find the materials you need in a disorderly work area. And when unneeded materials take up available work space, workers get in each other's way and have to wait to do their jobs.

What's the best time to clean up? The answer is "right now." Instead of waiting until the end of the day or week, do it as you go. Sure, cleaning up takes time too, but since the cleanup has to take place sooner or later, why not do it right away? The time you save is much greater than the time you spend cleaning up. It might be worthwhile to assign one or two people each day to keep the area clean, so job litter can be removed before it has a chance to get in the way.

In addition to cleaning up the obvious things like job litter, take a moment and look around from time to time. Is there anything in your work area that doesn't need to be there? What about lunch scraps, newspapers, discarded clothing? Can materials be stacked more efficiently (and more safely) to make more room? Is there something out of place that might cause an accident? If you see a housekeeping problem, take care of it. Or bring it to the attention of whoever is supposed to take care of it. When supplies are no longer needed, send them back to the supply yard immediately. This keeps the materials in better shape as well as saving time and space for work.

Resist the temptation to speed up the cleaning process by collecting everything in one bin or corner. When cleaning up, put things where they belong. That way you save time for the person who has to find what you put away.

You can see that good housekeeping saves time. It also saves frayed nerves. Because the area is not cluttered with unnecessary stuff, you have more room to spread out and do a good job without getting into your crew mate's face. I don't mean to sound like your mother, but isn't it time you cleaned this place up?

TOOLBOX TALKS

# No More Back Strains and Sprains

Lifting things is a big part of the work we do around here. We do it so often that it's easy to forget that there is a right way and a wrong way to lift things. Do it the wrong way and you may get away with it 50 or 100 times. But sooner or later you could become an instant invalid. Lower back injury—the most common work-related injury—can cause you lifelong pain and disability. Let's go over the steps for preventing back injury.


Before you begin lifting, wear gloves if you're handling rough equipment. And if you wear safety shoes, you can focus your mind on the load, not on your unprotected toes.

Get a good grip and good footing. Position your feet so that one foot is next to the load and one behind it.

Get under the load by BENDING YOUR KNEES, not your back. This is the single most important thing to remember about lifting.

Use your hands, not your fingers, to grip the load. Keep the load close to your body.

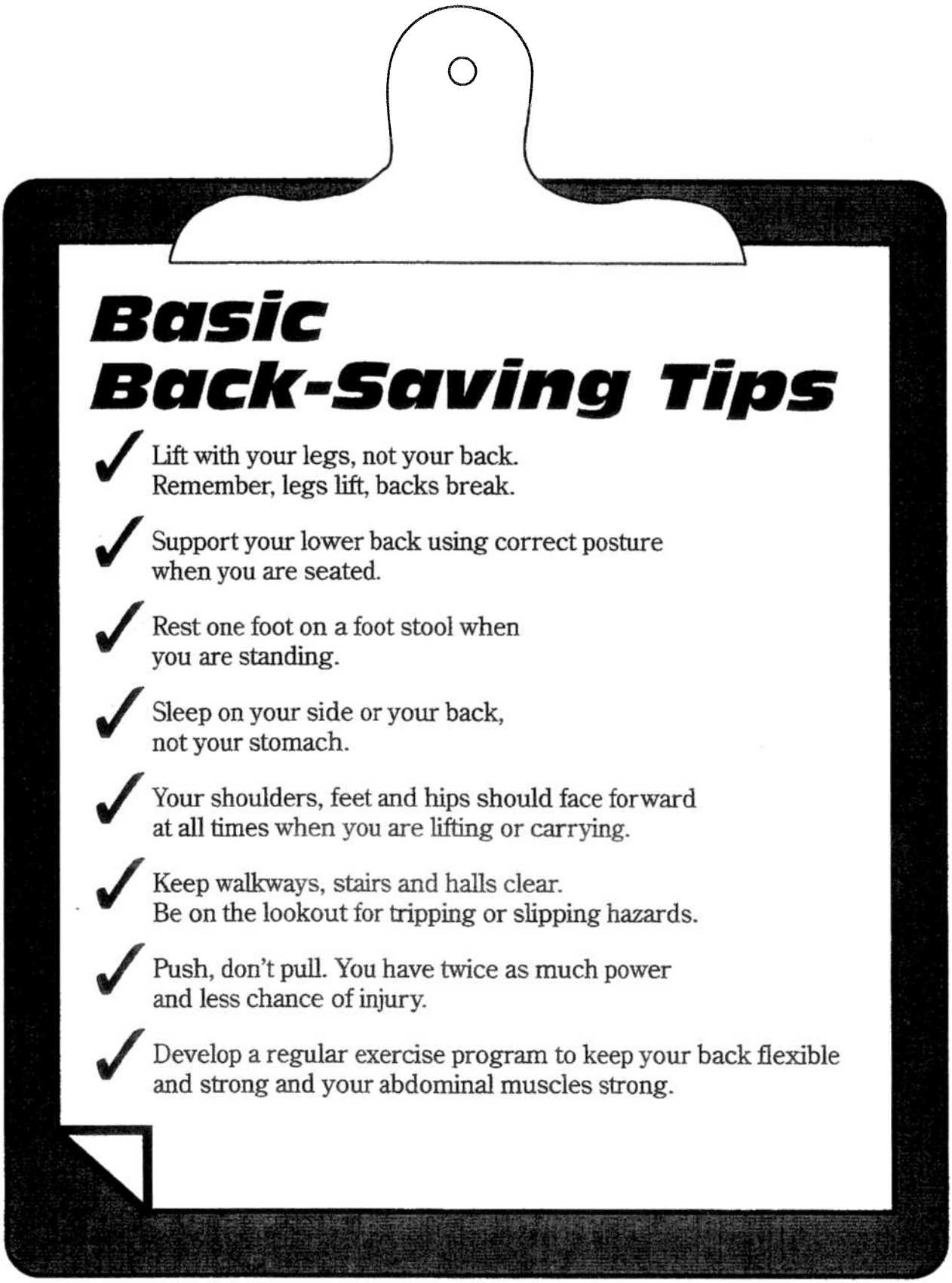
Never twist your body when lifting. Turn your whole body by using your feet.

But before you lift anything, how heavy is that load? Studies show that only 10 percent of male industrial workers can lift over 70 pounds safely. Most men shouldn't lift more than 37 pounds and most women shouldn't lift more than 28 pounds. Just because you can lift it doesn't mean you should lift it. Get someone to help you with heavy loads. It's a great way to make friends.

If you do experience back pain, pay attention to it. You will recover from simple strains or sprains by giving yourself a rest. Stay away from heavy lifting until the injury heals. Lifting with an injured back can lead to severe back problems.

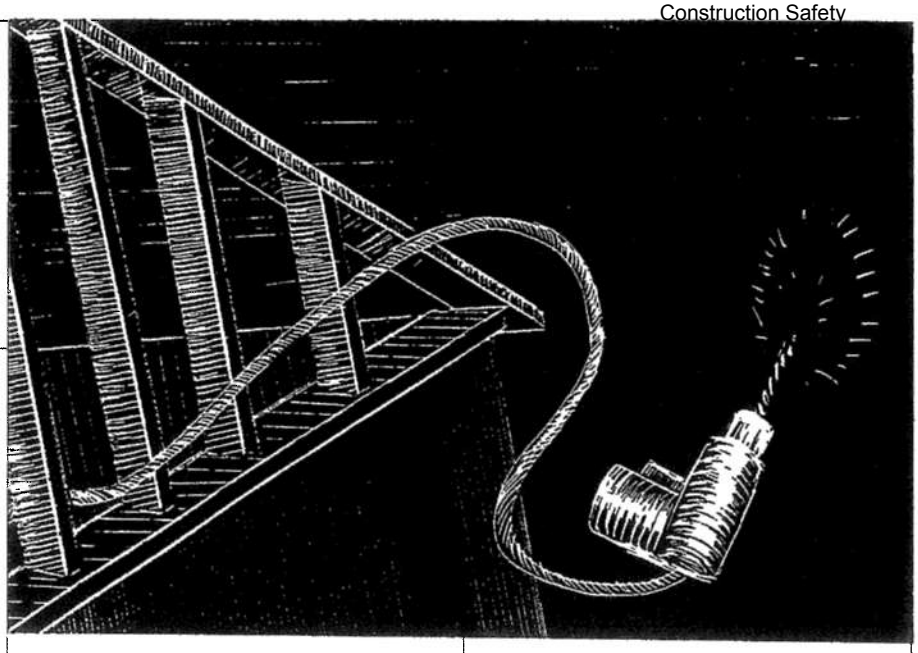
If heavy lifting is part of your job or if you strain your back often, do yourself a favor and get into good physical shape with a conditioning program that includes aerobics, weight training, and stretching exercises. Some workers find it helpful to wear back braces when on-the-job lifting is necessary.

Back injuries affect fully half of the nation's work force during their working lives. Follow the directions we've gone over here, and you can be sure of keeping yourself in the injury-free half.



TOOLBOX TALKS

# Even a Drill Can Kill



Portable electric power tools can be a lethal combination of electricity, sharp edges and fast moving parts. There's probably half a dozen power tools you know how to operate expertly. But do you know everything there is to know about using them safely? Let's review power tool safety. Even if you've heard most of it before, it's a good idea to keep safety procedures fresh in your mind.

Safety begins before you plug in a tool. To prevent unwelcome surprises, always make sure the switch is off. Inspect power tools for defective or broken cord insulation or plugs, improper connections, or a loose or broken switch before using them. Use only equipment that is in good condition. It must be properly grounded; if not, use a ground fault circuit interrupter (GFCI). Before switching on the tool, think about where you're working. Never use a power tool where flammable vapors or gases are present.

If you're sanding, grinding, chipping, or doing almost any other power tool task, use your safety goggles. Always leave the guards in place on portable saws. And pay attention to the direction of the tool's rotation. You're responsible for seeing that no one is in the path of flying particles.

Report your power tool as unsafe if you find insulation defects, if the brushes spark when the power is turned on or, more importantly, if you feel even a slight shock or tingle when using it. Avoid overstraining the tool by using it improperly. Use the switch lock only when the tool is in a stand or jig. Make sure you're on good footing when using heavy tools or working at an awkward angle, such as overhead. Tools can get jammed suddenly and cause you to lose your balance. When you turn off the tool, let it stop completely before putting it down—in a safe place where it can't hurt someone.

The biggest hazard of portable power tools is electric shock. When the insulation between the frame and the current-carrying part of the tool fails, the electricity always grounds itself along the path of least resistance—and most often that's you. When this happens you may sustain injury, severe burns, or a fall from a high place. You can expect electric shock to be especially severe if you're working in a damp place or if you sweat a lot. Electric shock can kill you. Keep your work area dry and keep cords away from heat, sharp objects, and chemicals that could damage their insulation.

One more note: as professionals, you don't need to be reminded not to mix horseplay and power tools. And you don't need to tolerate this sort of behavior from other workers. Your use of common sense, well-maintained tools, and the right protective equipment shows a healthy respect for both your tools and your life.

# Working Safely with Powder-Actuated Tools

Those of you who have used a powder-actuated tool know how much easier it makes your work. But these tools are as dangerous as loaded guns. That is why you must be specially trained and certified to use them.

A powder-actuated tool uses a powder charge the way a gun shoots a bullet. It "shoots" a fastener, or stud, into a surface, such as concrete or steel. Like bullets, studs improperly shot can injure or kill workers. All powder-actuated tools are equipped with special guards and muzzle fittings to keep you from getting hurt by a ricocheting stud or chips of flying masonry. The tool will not fire without such guards. Let's talk about how to safely use these powerful tools.

First, treat the tool exactly like a loaded gun. Never point it at anyone, put your hand over the muzzle, or drop it. Second, always unload the tool to transport or store it. The same goes for moving from job to job. Keep the tool unloaded until you are ready to drive a stud. Third, like a gun, a powder-actuated tool has a kick. Brace yourself when using it, especially on ladders or scaffolds.

The power loads for powder-actuated tools are essentially blank cartridges. They are color and number coded for power level. Always follow the manufacturer's instructions to select the right power load for the material you're firing into. Before loading the tool, check that the chamber is clean.

When you use a powder actuated tool, always wear eye protection, and wear hearing protection if you work in an enclosed area. Before beginning, test drive a fastener with a hammer, to double check that the surface is really the concrete or steel surface you think it is. Studs accidently fired into wood, sheetrock, or lath and plaster will go through the wall and out the other side with the force of a bullet. To be "on the safe side," make sure no one is working on the other side of the wall. And if you want to live long, avoid firing into brittle materials such as glass bricks, tile, cracked concrete, or stone, which are likely to shatter.

To drive a stud, press the tool firmly against the surface at right angles. Fire studs well away from the edge of the surface or any holes—at least one-half inch for steel and 3 inches for concrete. And remember, powder-actuated tools must not be used near explosives or flammables. To fasten close to an obstacle, adjust the guard so that the barrel is close to the guard edge. Use this feature

only when absolutely necessary. The guard is there to protect you. If the tool misfires, keep holding it firmly against the surface for 30 seconds. Then dispose of the power load according to the manufacturer's directions.

Clean and maintain your tool according to instructions and use only factory replacement parts. When using this powerful, dangerous tool, take the time to be sure of what you're doing. It's already saving you lots of time and energy—you don't need to save more time by cutting corners on safety.

# SAFETY TIPS FOR WELDERS

*Welding yields many important products, but it presents special hazards. Welding sparks have been known to travel as far as 35 feet, and welding spatter (hot metal) can burn right through clothing. That's why welders have to pay strict attention to safety.*

## Protective Equipment Is Essential

Eye and face protection are as important to welders as the tools they use, because welders are at risk for burns, heat radiation and flying bits of hot metal. Protective equipment can reduce these risks substantially.

OSHA requires gas welders to wear impact- and heat-resistant goggles. Nonflammable welding helmets are recommended for many operations. Arc welders must wear helmets and goggles that resist heat, fire, impact and electricity.

Some welding jobs call for a respirator to protect against the inhalation of fumes and gases. It must be properly fit-tested and the welder trained in its use.

## Choose Clothing Carefully

When welding wear clothing that will protect against burns from hot sparks or metal. Very hot work calls for a leather apron, leggings and sleeves. Street clothes are acceptable for some jobs if you wear a long-sleeved shirt.

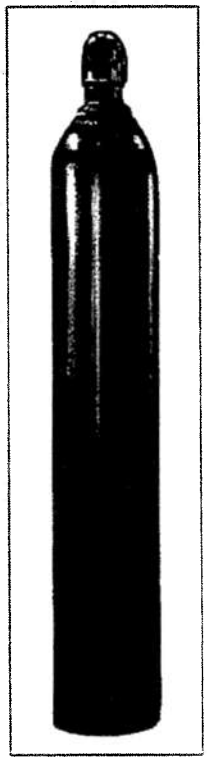
Keep your collar and cuffs buttoned and avoid clothes with pockets or cuffs that could catch sparks. Wear high-top work shoes with pant legs over them to keep sparks out. Keep clothes clean, since grease or oil spots can catch fire. If you're an arc welder, wear dry welder's gloves to protect your hands against electric shock. Use only nonflammable hair products.

## Fire Is the Greatest Hazard

*For any kind of welding, use these precautions:*

- Obtain a "hotwork" permit if your company requires one.
- Remove flammables from your work area before starting the job.
- Use a combustible-gas indicator to see if flammable gases are present in the area.
- Try to restrict your welding operations to a separate room with a fire-resistant floor. If you must work in a room with a wood floor, wet it down or cover it with a fire-resistant shield.
- Cover flammables you can't remove with a fireproof blanket.
- Close or cover any ducts that could transport sparks.
- Keep your work area free of trash.
- Keep fire extinguishers handy. Check them often to be sure they're working.
- Assign someone to be a fire-watcher.

## Safety Tips for Handling Gas Cylinders



- Be sure cylinders are properly labeled.
- Check equipment and hoses regularly for leaks.
- Don't use a leaking cylinder.
- Open valves slowly. Keep valves closed when cylinders aren't in use or are empty.
- Turn off gas when you leave your work area.
- Transport cylinders by strapping them to carts. Don't let them fall or bang into each other.
- Never roll or drop a cylinder.
- Use and store cylinders only in areas with good ventilation.
- Light flames promptly or the gas could build up and explode when you light it.
- Store cylinders away from heat on a level, fireproof floor in a dry, ventilated area.
- Store incompatible gases separately. Oxygen, for example, should not be stored with flammable gases.
- Always keep cylinders upright.
- Keep cylinders away from sparks and spatter.
- Take care not to run over gas hoses.
- Don't use oxygen to blow away dust or to clean your work.
- Never use grease or oil to lubricate a gas cylinder.
- No smoking, please!

# If You Work With PAINT

We don't usually think of paint as a hazardous chemical—after all, millions of people use paint in all sorts of situations, without wearing any special protective equipment, and they don't become ill from it—or do they? Knowing a little about the health hazards of prolonged or repeated exposure to paint substances can help you understand why OSHA requires you to protect yourself when using them.

## Health Hazards of Paint

Paint contains pigments, solvents, resins and other ingredients to give it color, texture, spreadability and durability. Many of these ingredients are hazardous to your health. First among them are the solvents, such as mineral spirits, naphtha and turpentine, that evaporate readily from paint exposed to the air. Even short-term exposure to these chemicals can cause dizziness, eye irritation, nausea, coughing and other symptoms. In addition, paints containing polyisocyanate hardeners can cause shortness of breath, chills and fever. Long-term exposure to paint ingredients, even when no short-term effects are noticed, can damage the kidneys, liver, blood or nervous system. Some even cause cancer and birth defects in laboratory animals.

You may work with paints for a long time with no ill effects. Suddenly you develop rashes, hives, swelling or scaling of the skin, or you begin coughing and having shortness of breath, which often leads to permanent lung damage or severe respiratory stress. This is sensitization, an allergic reaction to one of the ingredients in paint. Once you become sensitized, it is virtually impossible for you to work with the sensitizing substance again. This is why you must avoid contact with the paint in the first place by using the right protective equipment.

## Other Hazards

The volatile solvents in paint are flammable. Painting in an unventilated area near an ignition source—such as cigarette, spark or static electricity—can be dangerous. Paint containers exposed to high heat may explode. And some paints contain chemicals that may react violently with other substances.

## Protect Yourself

You can prevent exposure to paint chemicals by wearing the appropriate protective equipment—a respirator designed for painting, coveralls, chemical-resistant gloves and eye protections.

(Some of these have layered peel-off lenses that you can remove as they get covered with paint.) Use an appropriate respirator when spraying polyurethane paints and other paints in enclosed areas. Paint in ventilated spray booths, or work in a well-ventilated area. Change the respirator cartridge according to manufacturer's guidelines.

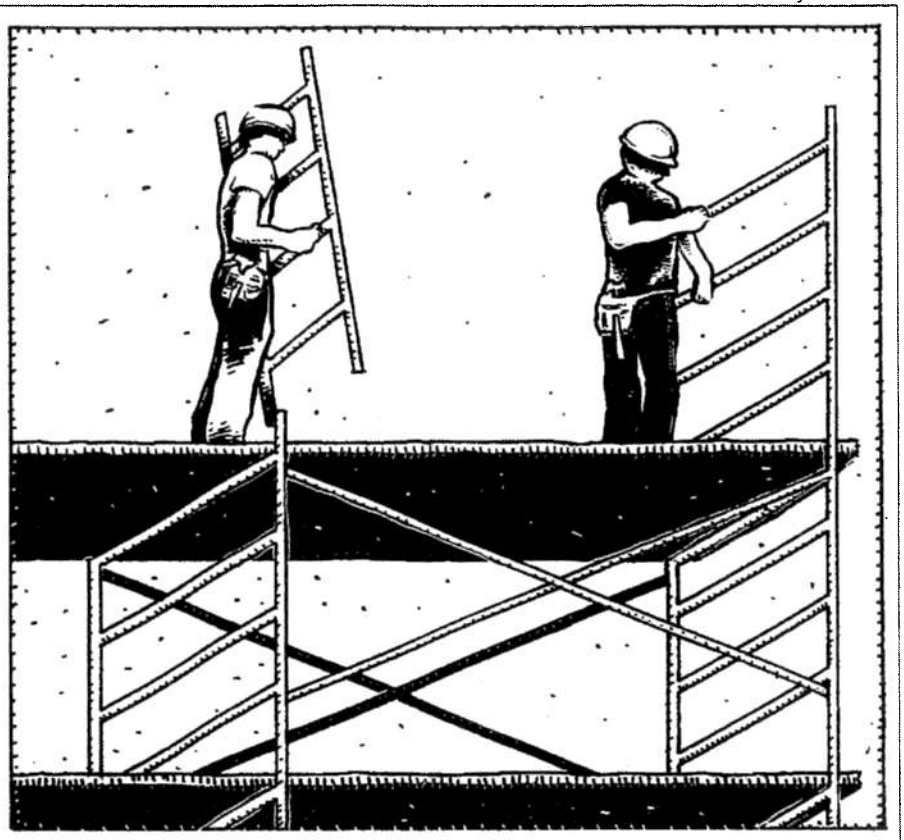
## Clean Up!

Proper cleanup means keeping containers closed, tightly sealed and properly labeled when not in use, and storing paints at the proper temperature. Dispose of empty cans and paint- or solvent-soaked rags in airtight receptacles. Use soap, water and a washcloth to clean hands; solvents and thinners can cause irritation, infection and severe drying of the skin, as well as toxic effects. Remove clothing soaked in solvents.

## Educate Yourself

Always read the label before beginning a paint job. Use your MSDS as a guide to what hazards your paint contains, what type of protective equipment to use, and whether or not the paint may ignite easily. The MSDS will also tell you how to contain and clean up a paint spill, and what to do in case of overexposure to paint. Remember, paints are safe to use, if you use them safely.

# Staying On The Safe Side of Scaffolds



Scaffolds are involved in most construction jobs. To make sure you're using the scaffold as safely as possible, let's take a few moments to review some guidelines for scaffold safety.

Proper setup depends on the kind of scaffold you're using. Each type of scaffolding has specific setup requirements that you should know:

- Pole scaffolding should be anchored in both length and height. The distance between anchors depends on their location and material. Check your company's OSHA rules.
- Free standing towers should be guyed if their height is more than three times the width of the narrowest part of the base.
- The manufacturer's recommendations for properly seating and locking all connections should be used with steel scaffolding.
- Wood scaffolds must have materials and bracing that conform to safety code.
- Foundation sills should be placed under all scaffolds that are set directly on earth.
- Never use "improvised" scaffolding, such as piling boxes on scaffolding to reach higher, instead of building the scaffolding higher.

Too many accidents happen during scaffold work. Most of these accidents can be prevented by putting a little thought into safe procedures and good housekeeping on and around the scaffold. Ensure your safety by taking these precautions:

- Inspect scaffolds each day before using them. Are the guard rails, connectors, fastenings, footings, tie-ins, and bracing in place and secure? Platforms must be closely boarded, fenced and securely fastened.
- Avoid stockpiling materials on scaffolds. Remove all materials and tools at the end of the day. Unnecessary materials on or around scaffolds can fall off and injure workers below or cause workers to trip and fall off the scaffold. Keep the platforms and the entire scaffold area clear of such hazards as debris, unneeded equipment and material.
- Never overload scaffolds. Keep necessary materials piled over ledger and bearer points to minimize platform loading. To prevent materials from falling off scaffolds, place screening up to guard rail height.
- Stay off scaffolds during storms or high winds and clear platforms of all ice and snow before using them. Use sand to make wet planking less slippery.
- Protect scaffolds from being knocked over or weakened. Never allow vehicles or materials to bump or strike against scaffolds. Use taglines to control material hoisted from the ground.
- Before working in high places, check holding devices such as ropes, cables, and chains for weaknesses caused by accidents or normal wear and tear.

When you work on scaffolds you carry your life in your hands—and the lives of your crew mates. Unsafe practices may injure you or others below or near the accident. Safety depends on the common sense of everyone using the scaffold.

# A Safe Site Is An Orderly Site

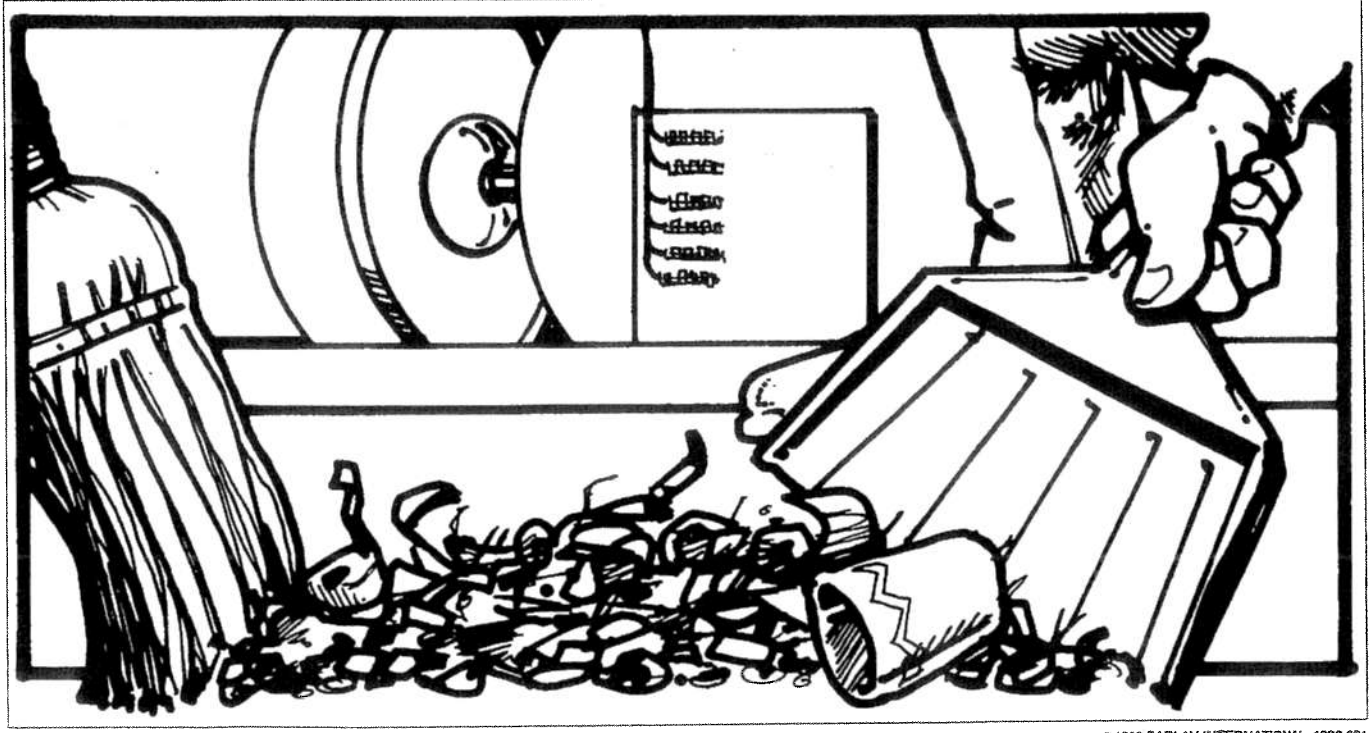
What does good housekeeping mean to you? For some, it might mean straightening the doilies on the sofa arms. But on a construction site, it's a matter of arranging the tools and materials you use in the safest possible way. Let's talk about a few of the ways we can make a work site safer with good housekeeping.

Here's a story about a fellow I'll call Joe. Joe was a good worker and prided himself on getting the job done fast. Well, one day Joe was hurrying to finish a job. He was working with a solvent-based cement. He knew about the dangers of flammable liquids, but he didn't want to take the time to dispose of the rags he was using to clean up with. He figured he could save a trip and dispose of them all at once at the end of the day. I think you can guess the rest. It was a hot day, there were dust and fumes in the air, and when Joe switched on the drill there was an explosion. It put an end to Joe's hard work, his construction company, and his life.

Most poor housekeeping accidents aren't as dramatic as Joe's. They involve tripping or stumbling over things that aren't where they're supposed to be, stepping on sharp objects, slipping on a puddle of oil or water, or using a tool that has not been properly maintained.

Good housekeeping here is a matter of separating scrap from usable material and storing it in scrap piles out of the work area. Rags, scrap paper, old rope, and dust are fire and accident hazards. Tools stored in their proper place not only look better, they are easier to find. How many of you have cut your hand while fishing through a toolbox full of sharp objects for the screwdriver in the bottom?

Keeping a safe, orderly site not only protects you, it makes you feel better about your job. It's a boost to your morale to know you're not walking into a mine field every morning. And it makes a big impression on anyone who is interested in the quality of your work—like your boss.



# The Safe Way to Handle Pipe

Pipe can be an awkward load to handle. It's hard to balance and it has a tendency to roll when loose. Let's talk about safe practices when handling pipe.

Stay clear of moving or rolling pipe. It's tempting to wait until rolling pipe gets close and then jump over it. This would be fine, except that sooner or later you're likely to slip or trip as you jump. When that pipe slams into you it can do a lot of damage. Watch out for moving pipe too, both to the side and above you. From one end, pipe looks like a very small load. But pipe swings a wide and deadly arc. And if it slips in the sling, one end can drop suddenly. Be on the lookout for these hazards.

When you're moving pipe in a sling, make sure it's balanced so that it won't slip out when it's raised. Move only one loose section at a time. It's not safe to try to move pipe that is covered with frost, ice, or snow in a sling. Use a caliper-type clamp for these situations.

Protect your fingers by keeping your hands on the outside of the pipe when you're guiding it. The sharp edges can cut your fingers—cut them right off if the pipe end hits something. If two of you are working as a team to carry a length of pipe on your shoulders, keep each other informed of what you're going to do next. You can injure your partner by dropping your end of the pipe unexpectedly or by not lifting at the same time as your partner does. Remember that pipe is like any other heavy load—lift it by bending your knees, not your back.

Store pipe with sleepers between layers and securely tie down each layer. When transporting pipe on two-wheeled pole trailers, place a wooden strip or piece of belting across the bolsters before loading the pipe. This makes it easier to tighten the binder to keep the pipes from slipping.

Like the many other hazards you find on the typical construction site, pipe is safe to work with as long as you use common sense and stay alert.

# The Three Fs of Welding and Cutting: Fire, Fumes, and Face

Welding and cutting operations are so dangerous that they are worth their own special talk. The dangers of welding can be summed up in three words: fire, fumes, and face. Let's talk first about protecting yourself and your work area from fire caused by sparks or molten metal drips.

The safest way to weld is to work far away from anything that can burn. But since this is not always possible, take plenty of time to clean up and prepare the area before you begin. This means clearing away combustible materials within 30 feet of your welding or cutting job, sweeping the floor clean of dust and debris, and protecting open doorways and windows with a fireproof curtain. If it's not possible to remove everything that can burn, take these precautions:

Cover wooden beams, partitions, floors, and scaffolds with sheet metal or asbestos. Or wet down combustible floors, but remember this can create a shock hazard if you're using electric welding equipment.

Put containers of water or sand below dripping slag or where pieces of hot metal might fall.

Keep water, sand, or a fire extinguisher on hand to put out fires caused by sparks. In extremely hazardous situations, have someone stand by with a fire extinguisher while you work.

Do you sometimes weld tanks or drums that may have held flammable liquids or gas? For your safety, insist on an approved test to show that there are no dangerous fumes left in the tank. Do it before you start welding. Never weld where flammables have been used recently or where there is dust in the air. If in doubt, use a combustible-gas indicator to check for flammable vapors.

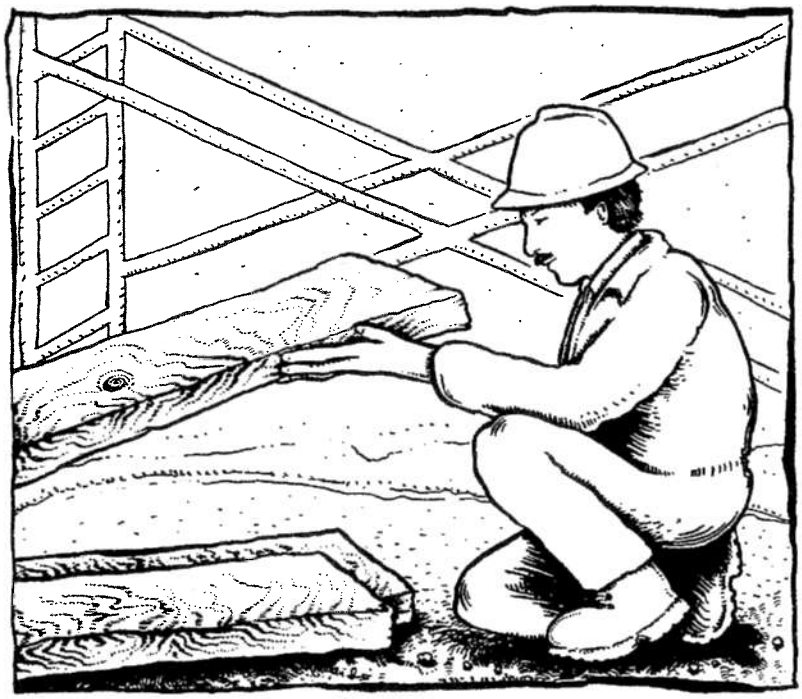
Because welding may produce toxic fumes, good ventilation is just as important to your safety as preventing fires. Those fumes are bad for your health! If screens around your work to prevent fire also interfere with ventilation, you may need to use special ventilating equipment or even wear a respirator. Never weld in a tank or small enclosed area without making sure you've got enough ventilation and are working in a "safe" atmosphere . Check with your foreman if you're not sure. You work better when you stay healthy.

Always protect your face and eyes from sparks, slag, molten metal, and from flash burns caused by radiation from welding equipment. OSHA requires gas welders to wear impact- and heat-resistant goggles. Arc welders must wear helmets and goggles that resist heat, fire, impact, and electricity. You know what kind of protection to wear on welding jobs—and not just for the actual cutting and welding. You may not need your helmet for chipping and cleaning metal, but you must wear goggles to protect your eyes from particles of metal.

Before you start any welding operation, for safety's sake make sure you are "covered" when it comes to the three Fs: fire, fumes, and face.

TOOLBOX TALKS

# A Scaffold Is No Safer Than Its Weakest Part



When you go up on a scaffold, your life depends on that piece of 2" x 10" lumber you're standing on. How can you be sure that plank is trustworthy? Let's talk about what makes a good scaffold plank and how to use it properly.

First of all, the plank should be not less than 2 by 10 inches in size. It should be rough-dressed, seasoned and straight-grained. There should be no large, loose or dead knots and no groups of knots in the plank.

It's important to inspect planks before you use them, but since you can't always tell by looking if a plank is sound, test it before you use it. The test is simple to do. Lay the plank across a pair of concrete blocks spaced the same distance apart that the scaffolding supports will be. Have two people stand in the center of the plank. Discard any plank that cracks or bends at a sharp angle under this load.

Once you know the plank is sound, be sure to use it right. Always secure the plank by wiring it to the scaffold. Or if you're using tubular steel scaffolds with fixed distances between the spans, the easiest way to secure the planks is to install cleats on them.

Take good care of scaffold planks. Never weaken them by cutting, drilling or nailing into them, or by allowing them to be fire-damaged by welding sparks. Planks can also be damaged by being thrown from a scaffold or by being driven over by vehicles or equipment. Remember, in the air the scaffold is your life support system. And a scaffold is only as strong as its weakest plank.

# Working Around Forklifts *Pedestrian Safety*

Nearly half of forklift injuries are suffered by pedestrians. Most of these injuries are bruises from moving forklifts, but workers also trip over the forks of parked forklifts. Sometimes workers stand on the elevated forks and fall off or stand too close to a working forklift in a confined space and get their toes crushed. Some injuries are serious, involving crushed extremities, and some are fatal.

## When Forklifts Aren't Moving

Even nonmoving forklifts can be dangerous. Look out for the forks. They lay flat on the ground, and you don't want to trip over them. Never walk under the elevated loads of a forklift. They may fall on you. Because only drivers licensed for forklifts are permitted to touch forklift controls, leave forklift controls alone.

## Forklift Refueling and Recharging Areas

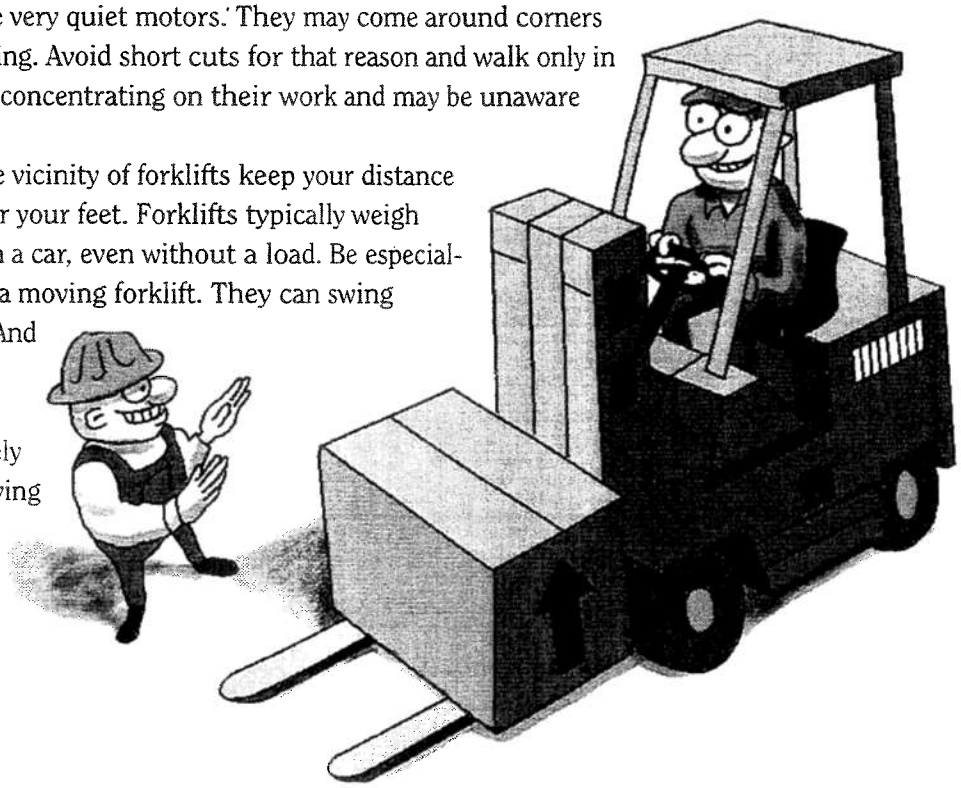
Observe all warning signs posted in refueling and recharging areas. Never smoke, light a match or cause a spark near a forklift that's being refueled or recharged.

## When You Work Around Forklifts

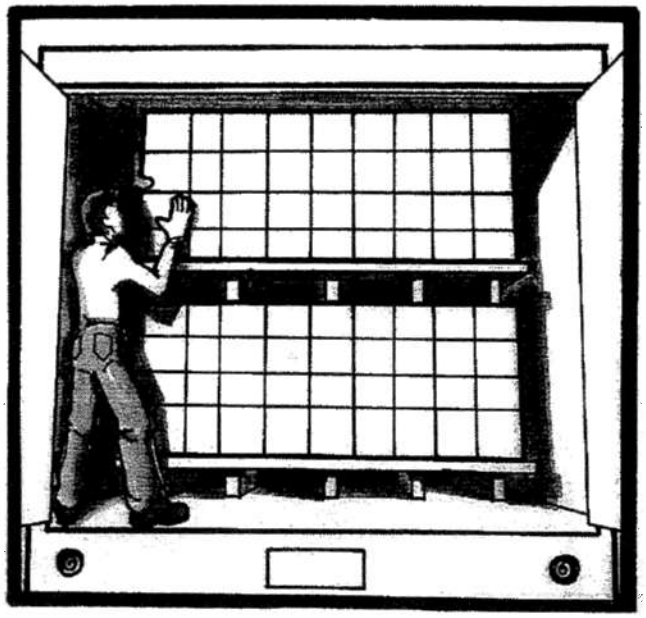
Stay alert. Many forklifts have very quiet motors. They may come around corners or across aisles without warning. Avoid short cuts for that reason and walk only in designated aisles. Drivers are concentrating on their work and may be unaware of your presence.

When you're working in the vicinity of forklifts keep your distance so their wheels won't run over your feet. Forklifts typically weigh three to four times more than a car, even without a load. Be especially careful near the tail end of a moving forklift. They can swing around surprisingly quickly. And when a forklift is backing up, stay clear.

Finally, forklifts are definitely not vehicles for horseplay. Trying to hitch a ride on one may be inviting trouble. Forklifts can be dangerous, so even as a pedestrian, treat them with respect.



# Packing and Balancing the Load



How you pack and balance the load determines:

- how your vehicle handles,
- what damage might come to your vehicle and cargo and
- the safety risks you will take.

Good loading practice results in a tight and well-balanced load. Objects do not fall or shift into each other. Axles do not bend under excess weight. You carry the maximum payload and deliver it in top condition.

## Tight Loading Tips

When you move, your cargo moves. Centrifugal force may send the weight of your load in the opposite direction of your driving maneuver. In addition, the highway is designed to slope down from the center to the sides, to drain water quickly. That means your load tends to shift each time you change lanes.

Tight loading protects your cargo, your vehicle and your driving capabilities.

- Pack same-size boxes to equal height, stepping down the boxes at the rear.
- Use the dunnage of cardboard, inflatable nylon or other fill material to eliminate dead space.
- Select rigid load locking devices to hold boxes in place.
- On the left side of the trailer, tape the top row of boxes so their weight can keep the ones underneath from shifting right.
- Comply with "This Side Up" and other special instructions.

## Balanced Loading

Your truck is designed to carry 90 percent of the cargo weight in the rear and 10 percent in the front of the van.

- Load so that the legal weight per axle is maintained.
- Create a low center of gravity and prevent cargo damage by loading all heavy objects on the bottom.
- Distribute partial loads the full length of the bed.
- Avoid putting a bulky load over the rear tires.
- Avoid loading over the tailgate to prevent frame damage.
- Put cardboard or plywood containers on top.
- Separate fragile and heavy objects with straps or dunnage.
- Use fiberboard to separate layers of materials that might leak.
- Avoid using cargo hooks.
- Load cargo by how it will be unloaded, first items to the rear.

## More Tips

Check your cargo containers before loading. Record and report:

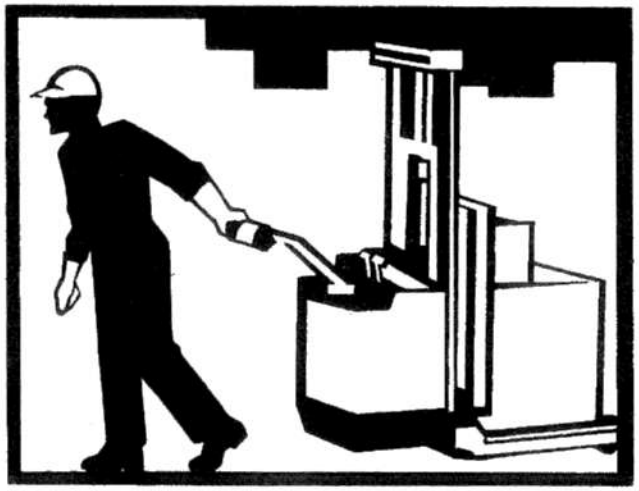
- objects too heavy for their containers,
- inadequate sealing,
- crushed, torn or otherwise damaged packages,
- rattles not certified "OK" and
- leaking packages.

If you load a refrigerated unit, keep in mind the characteristics of your truck. That is, where does it stay warmer? (In the front.) Where does it freeze? (Outside and rear.) How does the air circulate? (Down, under, up and over.)

## Safe Practice

If others load and unload for you, you're still responsible for the cargo you carry. Double-check the paperwork and make sure the loading is done right. Your own safety is at stake.

# Powered Hand Trucks



## The Safe Way

Powered hand trucks combine the usefulness of forklifts and manual hand trucks. But they also share many of the safety hazards of those material-handling aids. Although powered hand trucks are useful vehicles, they can't be operated casually. What are the dangers?

- getting caught in their moving parts, such as wheels or lifting mechanisms,
- falling loads because of incorrect operation,
- collisions with fixed objects, other vehicles or employees, or
- injuring a pedestrian because the operator is riding the hand truck rather than walking alongside it.

### What Makes Them Unique?

One of the unique features of powered hand trucks is control of the brakes by raising or lowering the truck's handle as you walk next to it. The power controls are also located in the truck's handle. Because of the additional skills required in operating powered hand trucks, most companies require operators to receive special training.

### Principles of Safe Operation

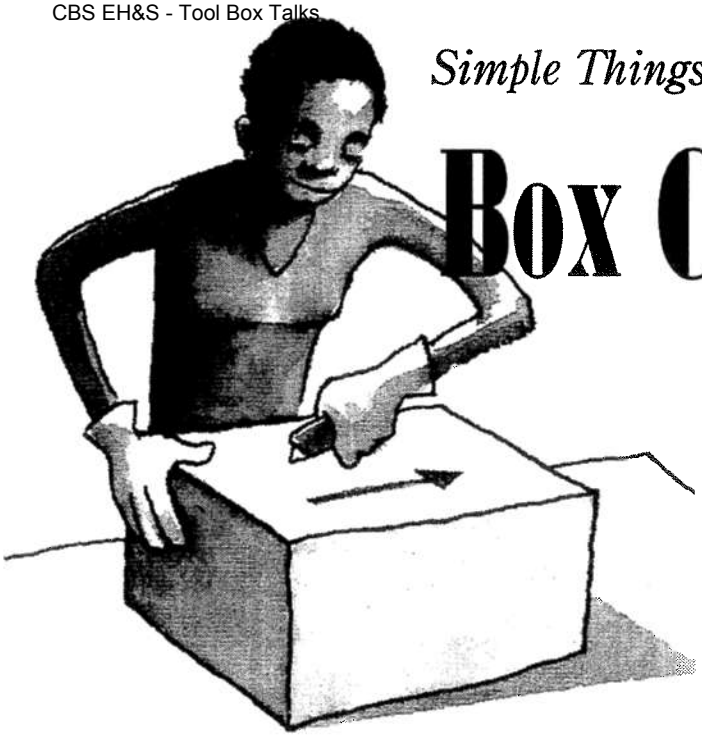
To operate a powered hand truck safely:

- Check the mechanical condition of your truck at the start of your shift. If you notice any defects, cracks or leaks, notify maintenance.
- Be sure you know how to start and stop the truck gradually.
- Lead the truck from the right or left side of the handle, slightly ahead of it and facing the direction of travel.
- When the truck must travel close to a wall, down an incline or into a tight space, operate it in reverse and walk behind it, facing the direction of travel.
- Operate and park trucks only in designated areas and never in areas with flammable, combustible or toxic materials, unless the truck is identified for such uses.
- Always give pedestrians the right of way.
- Stop at corners, doorways and aisle intersections and sound the truck's warning device.
- Keep the truck moving no faster than a normal walking speed.
- In order to keep a firm grip on the operating handle, keep your hands free of grease and water.
- Never ride the truck unless it's designed for that, and keep coworkers off it as well.
- Make sure loads are low enough to see over.
- Move only those pallets or skids that appear safe and are loaded correctly.

Walking next to a self-propelled hand truck that you're operating can be tricky. Following the above safety precautions should help you get your work done smoothly and without worry.

*Simple Things Can Hurt*

# Box Cutter Safety



One of the tools most commonly used by warehouse workers is the box or carton cutter. These tools usually have removable razor-sharp blades you can change when they get dull. Many models have retractable blades, allowing you to vary the length of the exposed blade depending on the thickness and density of the material to be cut.

## Choose the Best Cutter for the Job

There are several types of cutting tools used in warehouses:

- *Carton cutters* have a removable guard that acts as a guide for faster carton cutting.
- *Razor blade knives* are cutters that can convert into straight edge scrapers, depending on the angle at which you set the blade.
- *Retractable blade knives* have breakaway points that you can snap off for a new sharp cutting edge.
- *Utility knives* open into three or more positions, then safely retract the blade when not in use. Besides cutting boxes, these tools are commonly used for cutting fiberboard, wallboard, linoleum, carpeting, roofing, paper, etc.
- *Film cutters* have blades set in an angled hook-like head to cut through plastic strapping twine, stretch film, bubble wrapping and foam packing material.

## Box Cutters Can "Bite"

Here are some tips for the safe handling and use of box cutters:

- Handle all sharp or cutting tools while wearing cut-resistant gloves, which are often made of metal mesh.
- Always cut in a direction away from your body. And never use your thumb to stop a blade.
- When cutting cardboard with a box cutter extend the blade only as far as needed for the thickness of the cardboard. Not only do you get better cutting leverage and control, you reduce the danger of damage to the box's contents.
- Pass all tools, especially sharp ones such as box cutters, carefully, handle first. Never throw tools!
- Many box cutters carry replacement blades inside the handle. Be careful when opening the handle not to let the extra blades fall out.
- Store your cutter safely, making sure no sharp edges are exposed.
- If you do cut yourself, clean the wound and stop the bleeding using direct pressure. An ice pack over the wound may also slow bleeding and reduce any swelling. If the bleeding doesn't stop or if you haven't had a tetanus shot within the past five years, follow your company's rules on how to seek medical attention. Apply a medication only if told to do so by a doctor.

The common box cutter can be a great help to warehouse workers if used conscientiously. Make sure your box cutter remains a friendly and useful tool.

Hand tools and portable power tools may be a familiar part of your everyday work life. For this very reason, it's easy to forget that they can be dangerous if used improperly. You probably already know how to operate most hand and power tools. Take a moment now to make sure you know how to operate them safely.

## Tool Safety Rules

- Use the right tool for the job and make sure it's the right size for the job. When you use a wrench as a hammer or a chisel as a screwdriver, you risk damaging the tool, the material being worked on, yourself and anyone near you.
- Crowbars, commonly used in warehouse operations, must be the proper size and type or they can easily slip. Never work astride a crowbar. Stand to one side. And when not in use, make sure crowbars are stored out of the way.
- Keep your tools in good condition. A clean, sharp tool is a safe tool. A tool with a greasy handle or dull cutting edge can slip and cause injury. A cracked tool can fly apart the next time you use it, scattering sharp pieces like bomb shrapnel.
- Learn the correct way to use a tool. There is typically one right way—and many wrong ways—to use any tool. You may not know how to use a new or unfamiliar tool correctly. If you don't know, ask!
- Follow common-sense tool rules. Always cut away from yourself. Pull on a wrench; don't push it. Never modify a tool to increase its leverage or force. Use tools thoughtfully, with awareness and patience, rather than rushing, daydreaming or horsing around.
- Carry and store tools safely. Carry tools with the sharp parts pointed down and away from you. Store tools in a clean, dry place to keep them free of grease, dust and rust.

## Play It Extra Safe With Power Tools

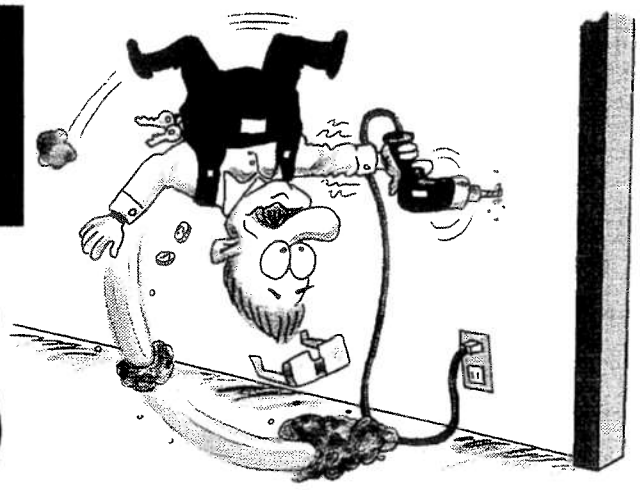
Power tools make it possible to do many tasks quickly and efficiently. But because they use electricity and have fast-moving parts, you must exercise caution when using them. In addition to standard safe-tool practices, follow these tips when working with portable power tools:

- Dress for safety. Remember, your hands and eyes are your most important tools. When you use saws or grinders, wear protective clothing to prevent cuts and burns. Always wear safety glasses when there is danger of flying wood, metal or particles.
- Inspect and test. Before you use any power tool, check it for broken parts or loose bolts. If you're using a tool with a sharp edge, use a scrap of wood—not your fingers—to test its sharpness.
- Start from "Off." Before plugging in a power tool, check the power switch to make sure it's in the "Off" position. It's dangerous to plug in a tool when the switch is "On." When you are through, make sure the tool has stopped before unplugging it or putting it down.
- Prevent shock. Be sure your tool is properly grounded and double-insulated. Keep cords away from heat, sharp objects and chemicals that could damage their insulation. Keep your work area dry. If you must work in a wet area, keep the power cord clear of wet surfaces or use a ground fault circuit interrupter (GFCI).

## Put Your Tools To Work for You

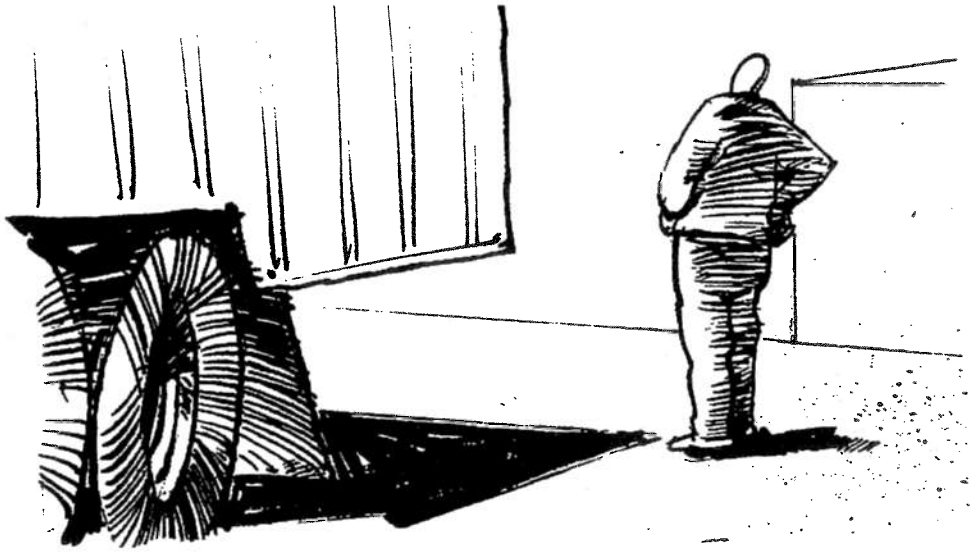
Hand and power tools are designed to work for you and make your job easier. When used properly they will help minimize errors and maximize safety.

# Tool Tips



# Working Safely With Hand and Portable Power Tools

# Keeping Sidewalks Safe for the Public



On a construction site, we expect to walk across broken rock or climb over ditches. We automatically keep a lookout for crane counterweights, equipment, and materials in our path, and things falling from scaffolds. But sometimes we forget that there is a whole world out there full of people who don't expect safety hazards as they walk past where we are working. And they aren't wearing hardhats.

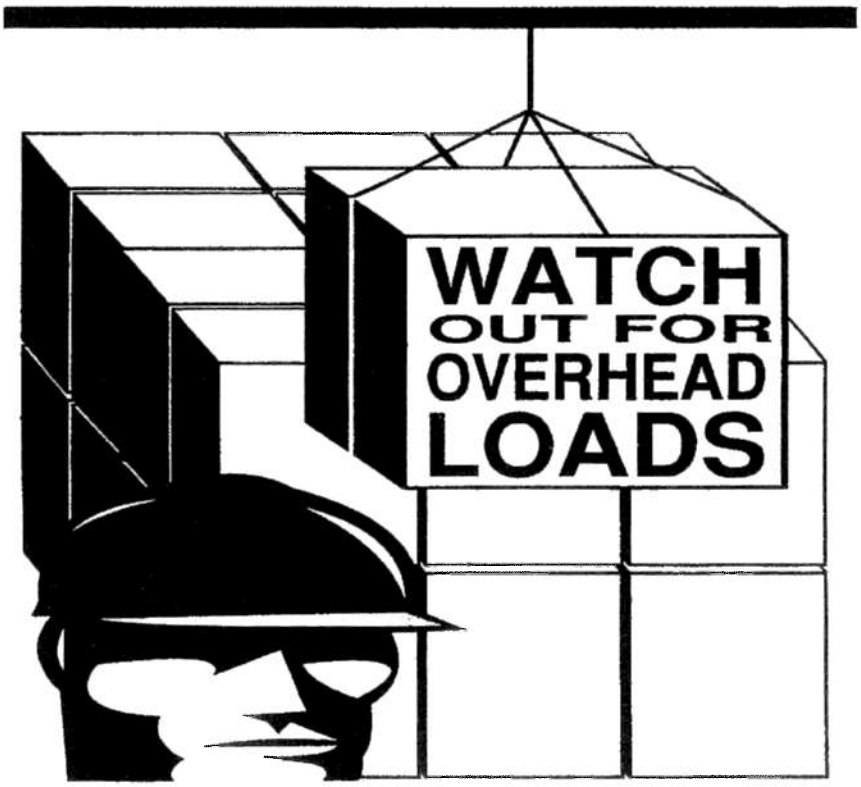
A simple crack in the sidewalk is a case in point. Someone who has been walking down that sidewalk every day for 20 years is not going to notice a new crack caused by construction work. And they may not be on the lookout for objects on the sidewalk. Be sure you don't leave anything, from a loose nail to a load of bricks, on a sidewalk that pedestrians can reach. Keep the sidewalk scrupulously clean and mend or report cracks immediately. Use barricades to keep the public away from damaged or hazardous sidewalks.

Elderly people are especially at risk in construction areas. Their eyesight, hearing, and reflexes aren't what they used to be, and they lose their balance easily. Always assume that the next person to walk by might be an elderly person and ask yourself if the way is safe for such a person.

Remember that pedestrian accidents aren't covered by Workers' Compensation. Pedestrians can and do sue construction companies for injuries they sustain in work areas. These lawsuits mean higher insurance rates for your company and less profits left over for your next pay raise.

So take a little time to be aware of the public around you. Make sure that barricades are in place and clearly visible. Report sidewalk hazards immediately. By watching out for the public, you could prevent a tragedy and save your company—and maybe yourself—from loss of income and public confidence.

# PROTECT YOURSELF FROM OVERHEAD HAZARDS




*If you work in an area where things can fall on your head, your best protection is a hard hat. Because they are made of plastic molded under high pressure, hard hats resist not only impact, but water, oil, acid and electricity.*

*A hard hat has a built-in suspension system that acts as a shock absorber to cushion a blow. Even if the hat is dented or shattered by something that falls on it, it still takes the force out of the blow. But to provide the greatest possible protection, a hard hat needs to be properly maintained.*

## Keep Spare Parts for Your Hard Hat

The outer shell of a hard hat is supported by a suspension cradle that attaches to a headband. This headband keeps the shell away from your head and provides a cushion if you're struck by a falling object. Since the headband and cradle are crucial to your protection, it's a good idea to inspect them periodically. If they show signs of wear and tear, replace them. Some companies keep extra cradles and headbands on hand for this purpose.

## Caring for Your Hard Hat

Never attempt to repair the shell of your hard hat once it has been broken. Ask your supervisor for a new shell.

Never drill holes in your hat or cut notches in the brim to improve ventilation. This weakens the shell and reduces the hat's ability to protect you.

Clean your hat every 30 days. Wash it in warm, soapy water and rinse it. Steam cleaning is also recommended for the cradle and headband. This keeps sweat and dirt from rotting them.

## Add Extra Protection

There are a variety of extra features available for use with hard hats. Hard hats with reflective trim, for example, can give you extra protection against traffic accidents if you work at night or in dark areas.

A chin strap is useful if you're exposed to strong winds. An eye shield made of transparent plastic can be attached to some hard hats; this shield secures under the brim and lies flat against the brim when not in use. Brackets to support a welding mask or miner's lamp are also available.

## Wear It Right

What protects you most when you wear a hard hat is the shock-absorbing space between the hard shell of the hat and your head. So whatever you do, don't interfere with the suspension.

Suspension is greatly diminished if you wear a regular hat or parka hood under your hard hat. Instead, request a winter liner if you need extra warmth. Storing your work gloves between the shell of your hard hat and its suspension also diminishes protection. Keep that space between the headband and the shell free and clear so you'll have all the cushioning possible if something falls on you.

# CHOOSING AND USING LADDERS

*When you're in a hurry to reach a high place, it's tempting to climb on a chair, table or anything handy to get there. But is it worth the risk? This year, more than 30,000 people will be disabled by falls involving ladders and ladder substitutes. The good news is that most ladder accidents are preventable. All it takes is the right ladder in good working condition along with solid placement of that ladder before climbing on it.*

## Choose the Right Ladder for the Job

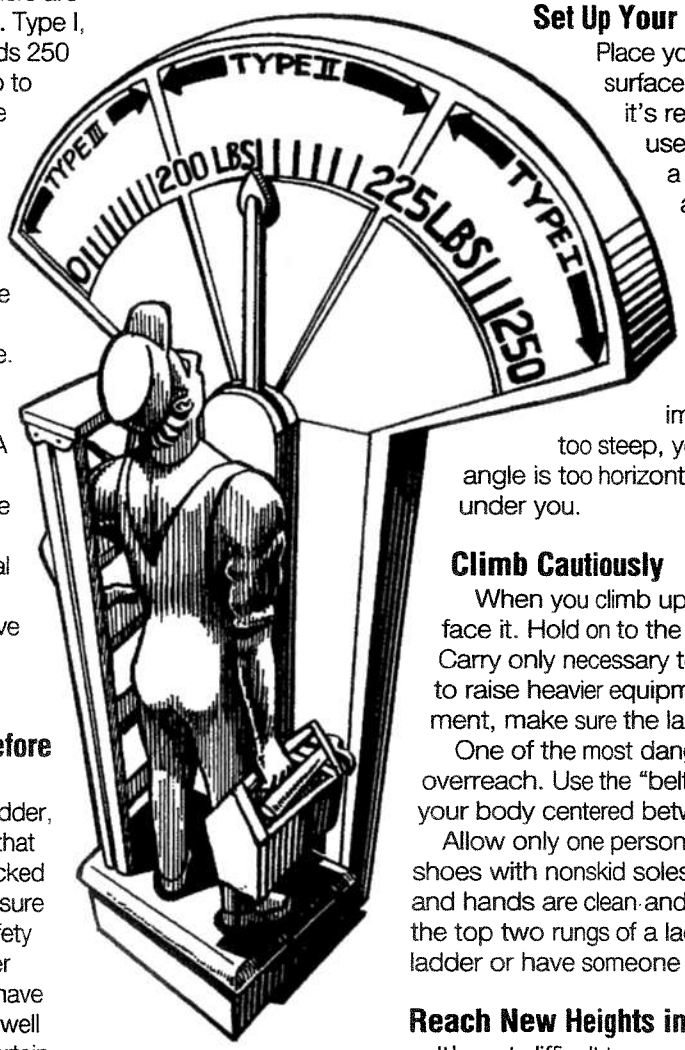
When you select a ladder, make sure it's strong enough and long enough for the job. Ladders are labeled with duty ratings. Type I, the industrial ladder, holds 250 pounds. Type II loads up to 225 pounds. Type III, the household ladder, holds up to 200 pounds. Check the ladder's rating and don't exceed its limits. Remember to include the weight of the tools or materials you plan to use.

If you work around electrical wires, don't choose a metal ladder. A number of accidents occur each year because power lines and equipment wires contact metal ladders. Use a dry wooden or nonconductive fiberglass ladder for this kind of work.

## Inspect the Ladder Before You Use It

Before you use any ladder, inspect it. Make certain that the spreaders can be locked in place when open. Be sure straight ladders have safety feet. Metal ladders, either straight or step, should have rubber or plastic feet as well as step coverings. Be certain the ladder's steps are wide enough for you to spread your feet for balance.

Check for loose or bent rungs. A rung that revolves may seem solid, but if it twists unexpectedly under your weight, you could lose your balance and fall. Look for cracked side rails on wooden or plastic ladders and for bent parts on metal ladders. Replace any missing parts and tighten loose hardware, but don't try to repair major structural damage. Instead, invest in a new ladder.




When you select a ladder, make sure it's strong enough for the job, and remember to include the weight of the tools or materials you plan to use.

## Set Up Your Ladder Carefully

Place your ladder on a firm, level surface with its feet parallel to the wall it's resting against. If you have to use the ladder in a busy area, use a barricade to prevent collisions and lock any nearby door that opens toward you.

Use the four-to-one ladder rule: Set the base of your ladder one foot away from the wall for every four feet of ladder height. This ratio is important because if the angle is too steep, you can fall backward. If the angle is too horizontal, the ladder can slip out from under you.

## Climb Cautiously

When you climb up or down a ladder, be sure to face it. Hold on to the side rails with both hands. Carry only necessary tools on your belt, use a rope to raise heavier equipment. If you use power equipment, make sure the ladder is securely tied.

One of the most dangerous ladder hazards is to overreach. Use the "belt buckle" rule: Always keep your body centered between the rails.

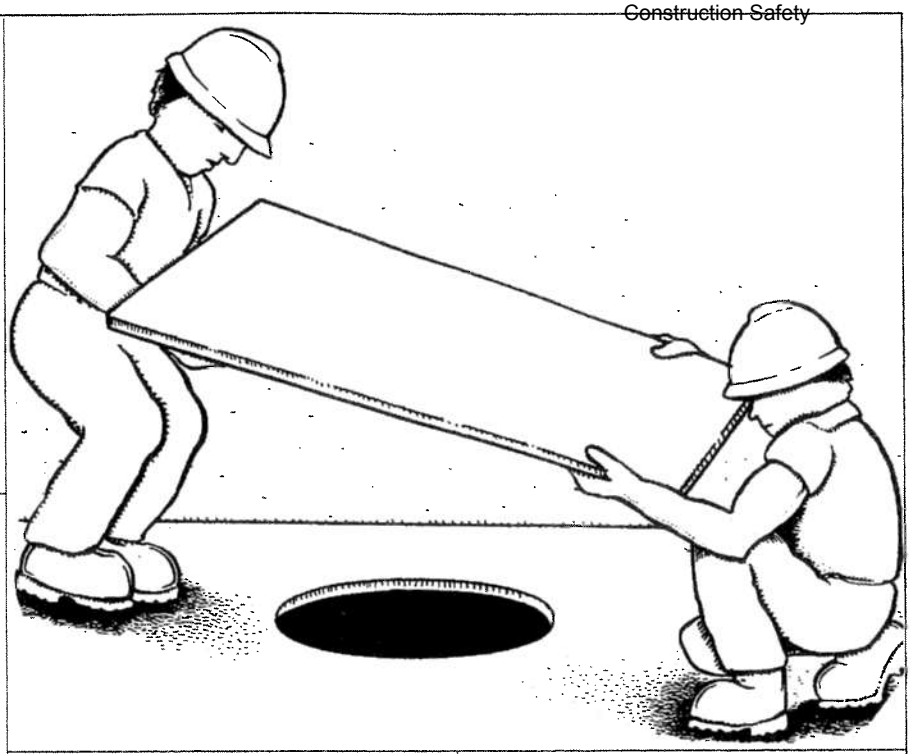
Allow only one person on a ladder at a time. Wear shoes with nonskid soles, and make sure your shoes and hands are clean and dry. Remember, never use the top two rungs of a ladder, and be sure to tie off the ladder or have someone support the base.

## Reach New Heights in Safety

It's not difficult to use a ladder safely. Just keep in mind four basic rules:

- Choose the right ladder for the job.
- Inspect the ladder before you use it.
- Set up the ladder up with care.
- Climb carefully.

# Covering Floor Openings



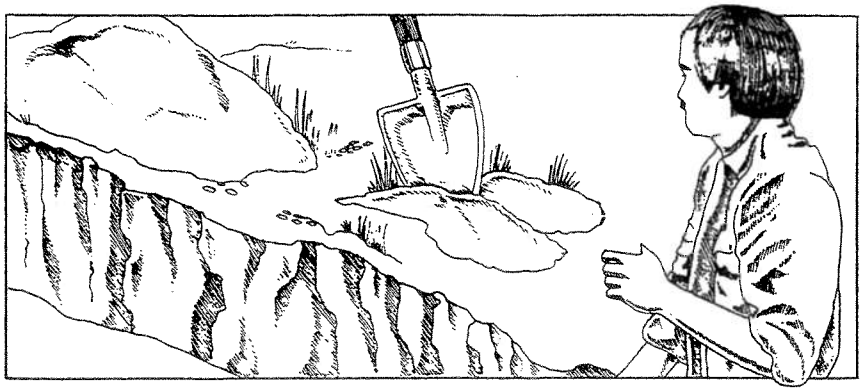
It was a small hole—barely big enough for a man to fit through. Terry was going to cover it in the next hour. He grabbed a sheet of 4' by 8' plywood from the stack, threw it over the hole and went to lunch. Along came Will and Jake, who needed just such a sheet of plywood. Wondering why someone had left good plywood lying on the floor instead of stacked, they decided to use the piece on the floor. Naturally, with the plywood between them, they didn't see the hole. Suddenly Jake was standing alone, with one end of a piece of plywood. All that remained of Will was a series of colorful comments coming from the floor below.

We can laugh at this story because Will escaped with only a few bruises, but you can bet that he made sure Terry didn't make the same mistake again. Covering a floor opening safely, so that other people don't get hurt, calls for more than just laying the material over the hole or even nailing it down. There's a right way to do everything, and doing less than the right way results in less than complete accident prevention.

Never leave a floor hole unguarded, even for a few minutes. Choose a floor covering that is big enough to overlap the edge of the hole generously. It should be thick enough to cover the hole without sagging in the middle. The bigger the hole, the thicker the covering should be. Unless you intend to stand there and warn everyone who might possibly go past that hole, nail the cover down, even if it's only going to be there an hour. Why take chances? If someone you work with ends up in the hospital because of your carelessness, you've not only disrupted someone else's life, you've also increased your own workload while the other worker is laid up and probably put your job on the line.

One more thing. If you see a hole that is unguarded, not covered, or improperly covered, whose business is it? The answer is, it's everybody's business. Even if it means taking time out from a tight work schedule, report improperly covered holes immediately. Taking responsibility for others' safety is good for business, and that's good for you.

# Preventing Trench Wall Cave-Ins



Excavating and shoring trenches is a job that must be carefully planned and carried out. Each situation is different, depending on the type of soil, the size of the trench, how close the trench is to existing buildings, and the weather. A trench that is inadequately shored for the soil type or moisture level can be a death sentence for those who work below the surface.

When you work on a trench, follow procedures exactly. They have been carefully determined according to federal, state and local regulations for the soil type on your site. Most cave-ins are caused by not using shoring, using inadequate shoring, excavating too close to a building or utility pole, or misjudging the stability of the soil. Keep these points in mind when working with trenches:

- Keep trenching machines level to prevent undercutting the soil. Keep the shoring as close as possible to the trenching machine without being damaged by the machine's operation. Pile excavated soil at least two feet from the edge of a trench.
- Don't rely on trench shoring to support platforms for equipment such as cement mixers and wheelbarrows. If equipment must be used over a trench, provide extra vertical supporting members between the stringers of the shoring.
- The sheeting that forms the wall of the shored trench must extend at least 18 inches above the top of the trench.
- Use extra caution when walking or moving equipment around trenches. Equipment or soil dropped into the trench could injure workers below. Tripping on equipment or excavated material and falling into a trench is a common worksite accident.
- Heavy vibration weakens trench walls. Avoid using vibrating equipment such as jackhammers for rock splitting. Also avoid tamping and backfill operations nearby, unless the trench has shoring adequate to withstand the stresses they cause.
- Before getting into any trench, make sure that the cross bracing is in place and tight. Cross bracing may be screw jacks, hydraulic jacks, or timbers, cleated and rigidly jacked or wedged.
- When there has been a change in the weather, such as a heavy rain or thawing after a freeze, check with your supervisor before going into a trench. Trench walls that were safe when dry or frozen can collapse when saturated with water or thawed out.
- Any time you move earth you create an unstable situation. To keep tons of rock and earth in the unstable arrangement of a trench, pay extra careful attention to the details of digging and maintaining that trench.

# TOOL BOX TALKS
## How To Give A Tool Box Talk

Communication is one of the best ways to prevent accidents. And one of the best ways of communicating the importance of safety on a construction job is through toolbox talks. You don't have to be a professional speaker to give a good toolbox talk. But there are ways you can make your talks more effective. Let's take a look at them.

**The Agenda**

Know your topic and plan your agenda a few days before the meeting so you're well prepared. (Be able to present the talk without reading it and lead a discussion afterward.) Wherever possible use actual equipment to illustrate your points. Coordinate hand-out literature or other material you intend to use at the meeting.

Limit the length of your presentation. Given your operation, you would be the best judge of how much time to set aside. Generally speaking, a half-hour is adequate. Allow for questions and answers afterwards-about 15 minutes.

Use visual examples. There's something to be said for "Seeing is believing." ff you're talking about ladders, have one handy so that you can point out such things as loose rungs or split side rails. If you plan to talk about the danger of using patched up hand tools, show a few samples. Consider a chisel with a mushroomed head; a hammer with a taped handle.

Do a wrap-up. Reinforce the important points brought out during the meeting. Thank your staff for their interest and enthusiasm.

**The Format**

Staff the meeting out on a positive note. After welcoming your staff, promote team work and how toolbox meetings not only provide valuable information but give everyone the opportunity to get together and exchange ideas. Be sure to compliment a job well done. Morale plays a bigger part than people think in affecting productivity and job satisfaction.

Keep it informal. Even though you may be using this resource as well as others, use your own words in making the actual presentation. For effective and rewarding results, do what's comfortable for you.

Invite people to participate. The purpose of any toolbox talk is to get people to think about safety problems. Make the talk a hands-on session. Have your people name hazards and what to do about them. Encourage them to offer suggestions to improve safety. When asking questions, use open-ended questions instead of questions that require only a yes or no answer.

**The Topic**

Choose timely topics. Gear your talks to safety problems you are encountering at the moment or that you anticipate in upcoming jobs.

- Review recent injuries-
  - What happened?
  - Why did it happen?
  - What should have been done?

- Review recent safety violations-
  - What was the violation?
  - What hazard did it create?
  - What injury could have occurred?

- Review upcoming work schedule-
  - What hazards are you concerned about?
  - What safety equipment should be used?
  - What procedures should be followed?

**The Place and Time**

Hold the meeting in your work area. We recommend holding the meeting first thing in the morning or immediately after lunch when the workday will least be interrupted and the work area relatively quiet.

Hold a toolbox meeting once a week to reinforce your company" philosophy that job safety is important.

We hope our toolbox talks help you in the daily operations of your business. Keep them handy. Like any tool, they can" help unless you use them. If you have any questions, contact your EHS representative.

TOOLBOX TALKS
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TOOLBOX TALKS
TABLE OF CONTENTS (continued)

# CBS *INJURY AND ILLNESS PREVENTION PROGRAM*

## Appendix G: EMPLOYEE SAFETY TRAINING

**Location:** _____

**Date:** _____

**Conducted By:** _____

**Topic:** _____

_____

_____

**Attendees:**

| Name (Print) | Signature |
|---|---|
| _____ | _____ |
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# Safety Matters—

## Even In an Office

Your ordinary office routine may *seem* safe enough. You probably take the elevator or stairs, use the coffee maker, open and close drawers, and lift stacks of files comfortably and easily every day. Although all of these daily office activities may be second nature to you, they can be more dangerous than you might suppose—especially because you and your co-workers don't expect problems. Learn to look with new eyes for these common safety hazards in your office.

- Falls are the most common office accidents. They happen while people are walking, climbing stairs, even leaning back in chairs. Keep an eye out for telephone extension and electrical cords, and open drawers, which can cause people to trip. Loose or worn carpeting, slippery floors or packages left sitting in aisles can send even the most sure-footed for a nasty tumble. Correct these hazards when you can, and when you can't, point them out to others to prevent accidents.

- File cabinets are a primary source of office injuries. Top-heavy drawers can cause a cabinet to topple over. Sharp corners of metal file cabinets can cause injuries. Drawers can pinch fingers if slammed shut. Open only one drawer at a time, and close drawers slowly and carefully.

- Office avalanches occur when too many boxes, papers or other materials are stacked too high for safety. All it takes is someone to pull out something from halfway down the stack to send everything tumbling down. Keep papers inside cabinets—not on top of them.

- Electrical shock can result from frayed wiring, improper grounding or malfunctioning equipment. Check equipment and plugs regularly. All offices should have a three-wire grounding system.

- Fires can occur anytime. Smoking is a common cause; so is electrical equipment. Look for people lighting up in no-smoking areas, or throwing matches or still-lit cigarettes on the floor or in wastebaskets. Flammable materials that are too close to coffee makers, space heaters or hot plates are also dangerous; keep them at least 18 inches away.

- Lifting loads improperly can lead to strains and other back injuries. Twisting or jerking while lifting can also cause injury. No one should try to lift a heavy or awkward load alone.

- Repetitive motions, such as those involved in typing, can cause injuries to the hands and arms. Anyone working on a keyboard should be trained in proper hand position and should take breaks to exercise and stretch hands and arms.


Falls and file cabinets are common sources of office accidents and injuries.

# Watch Out for Office Avalanches

Even the most well-organized office accumulates stacks of papers and other materials. When these stacks are allowed to develop into small mountains on top of file cabinets or other high places, they invite disaster in the form of an office avalanche. Overloaded file cabinet drawers and mishandling of cabinet drawers are potential sources of office accidents. Don't let yourself or your co-workers get caught beneath a heavy pile or cabinet—take precautions to keep your office avalanche-free.

## Safe Stacks

Stacking papers, files, boxes and other materials on top of file cabinets may seem like a shortcut. But the injury and disorder that may result doesn't save time in the long run. Someone who needs a folder that's halfway down a stack might pull it out without removing what's on top, and send the stack toppling down. A co-worker who needs something on top of a stack may stand on a chair to reach it, and risk a serious fall. Even a pile that's neatly stacked may be sent tumbling by opening and closing file drawers.

To keep stacks—and personnel—safe, keep piles low and easy to reach. Or, better yet, make a habit of storing materials inside tall cabinets and files. If you must take something from the top of a cabinet that is beyond arm's length, use a stepstool or stepladder—not your desk, chair or other furniture. To prevent equipment avalanches, keep calculators, typewriters and other machines away from the edges of desktops, counters and file cabinets.


**Stacking papers, files, boxes and other materials on top of file cabinets invites disaster.**

## File Cabinet Safety

Avalanches are also caused by top-heavy file cabinet drawers. Pulling out one overloaded top drawer that is not securely bolted can cause the whole cabinet to tumble over on top of you. The same can happen if you pull out two drawers at once or if you pull out an upper drawer while standing on a lower one. Full file cabinet drawers are heavy and can cause serious injury if they fall on you.

Prevent toppling cabinets by keeping all heavy materials in the bottom drawer. Always use only one drawer at a time. Open file drawers carefully, and only as far as you deem safe. If you're using an unfamiliar cabinet, test the drawers to see if they have locking devices; if they don't, you could inadvertently pull the drawer all the way out and onto yourself.

## Stay on Avalanche Alert

Look for avalanche zones in your office. Take action yourself and encourage others to correct problem areas. With a little extra attention, you can help avoid potentially serious injuries and keep your office a safe place to work.

# Bad Posture Blamed For Stress and Strain

Poor posture is one of the major culprits in the growing incidence of back, neck and shoulder pain in offices across the country, according to the results of a recent study.

"We're pleased to announce that millions of office workers need no longer suffer daily stresses and strains caused by bad posture habits," says Dr. Stan Upstraight, Director of the Office Posture Research Center.

Because of poor posture, many office workers eventually experience muscle tension, stiffness, backaches, neckaches and fatigue. More serious problems, such as disc injuries or pinched nerves, may originate with bad posture.

**Dr. Stan Upstraight, Director of the Office Posture Research Center.**

**Good sitting posture protects you from injury and boosts energy.**

## Common Causes

Researchers have determined that many common office posture habits place excess strain on the body. Leaning or slouching over a desk, for example, can overstretch the ligaments that support your spine, causing backache and fatigue. Holding a telephone receiver between your head and shoulder can harm sensitive structures in the neck. And sitting in one position for prolonged periods can reduce circulation to your muscles, increasing fatigue and stiffness, setting you up for injury.

## An Easy Solution

Fortunately, correcting bad habits provides relief and prevents future problems, says Upstraight. Good sitting and standing posture protects you from injury and boosts energy. Once you know what to do, you can practice good posture throughout the day, whether you are sitting or standing. It is also the basis for bending, lifting or reaching. Changing postural work habits may take a little practice, but the return in comfort and energy go a long way toward helping you look and feel your best.

## HEALTHY POSTURE TIPS

- When sitting or standing, keep the three natural curves of your spine in their normal, balanced alignment. (Your back is balanced when your ear, shoulder and hip are in line.) A balanced back keeps the spinal muscles actively sharing the load that gravity places on bones, ligaments and discs.
- Adjust your chair height so that you sit with your feet flat on the floor. Your knees should be level with or slightly lower than your hips. Your buttocks should touch the back of your chair, and your lower back should be supported.
- Hold reading materials at eye level, supporting your elbows on your desk or on the arms of your chair. Use a vertical stand for typing materials.
- Avoid cradling the phone receiver between your head and shoulder. Use a headset or speaker phone if you need your hands free while on the phone.
- Arrange your work area so that frequently needed materials can be reached without twisting, stooping down or reaching overhead.
- Relieve pressure on the lower back by taking occasional stretch breaks. Stand up and walk a little to increase circulation. A few simple exercises, such as neck stretches and shoulder shrugs, can also relieve tension when performed every hour for just one minute per exercise.

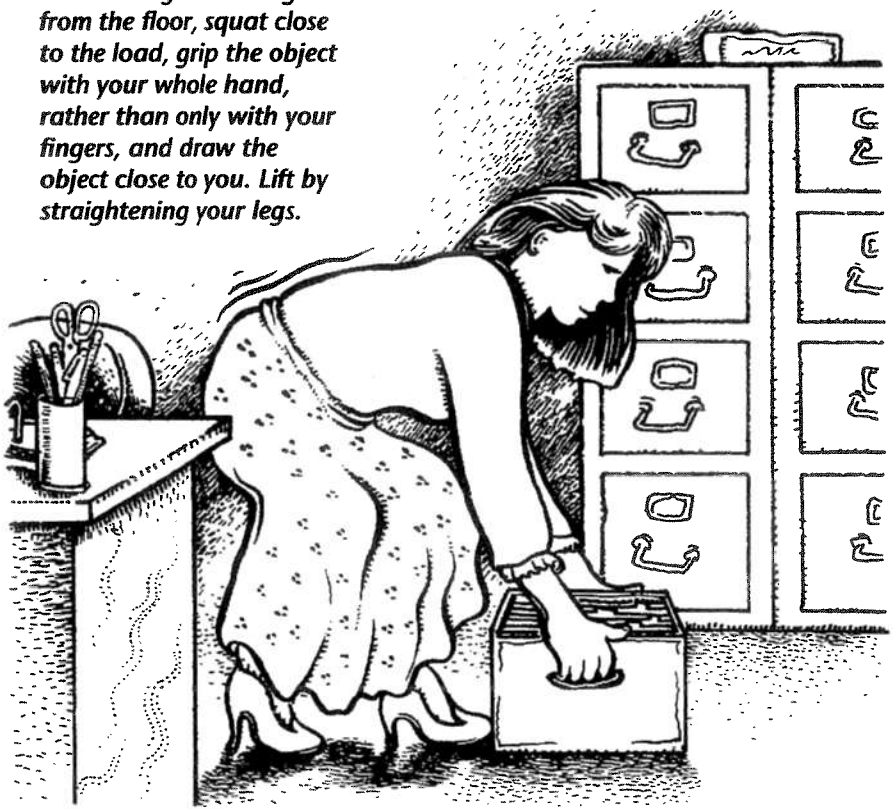
# The Office Is No Haven From Lifting Injuries

Although your office job may not involve lifting large or especially heavy objects, it's important to follow the principles of safe lifting. Small, light loads—stacks of files, boxes of computer paper, books—can wreak havoc on your back, neck and shoulders if you use your body incorrectly when you lift them. Backs are especially vulnerable: Most back injuries result from improper lifting. Observe these basic principles in the office for anything you lift.

## Safe Lifting Steps

- Take a balanced stance, feet placed shoulder-width apart. When lifting something from the floor, squat close to the load.
- Keep your back in its neutral, or straight position. Tuck in your chin so your head and neck continue the straight back line.
- Grip the object with your whole hand, rather than only with your fingers. Draw the object close to you, holding your elbows close to your body to keep the load and your body weight centered.
- Lift by straightening your legs. Let your leg muscles, not your back muscles, do the work. Tighten your stomach muscles to help support your back. Maintain your neutral back position as you lift.
- Never twist when lifting. When you must turn with a load, turn your whole body, feet first.
- If you have to lift a load to a point above your shoulders, plan to stop momentarily once you stand up to rest the load on something and change your grip.
- Never carry a load that blocks your vision.
- To set something down, use the same body mechanics designed for lifting.

***When lifting something from the floor, squat close to the load, grip the object with your whole hand, rather than only with your fingers, and draw the object close to you. Lift by straightening your legs.***



## Lifting From Your Chair

If you need to reach something that has fallen off your desk while you are working, you may be tempted to lean over from your chair to pick it up. Don't do it. Bending from a seated position and coming back up places tremendous strain on your back. Also, your chair could be unstable and slip out from under you. Instead, stand and move your chair out of the way. Squat and stand whenever you have to retrieve something from the floor.

## Think First

Before you lift anything, no matter how small the load, think first about the safest route for going down and coming back up. By following safe lifting principles you can protect yourself from injury.

# You Can Do Something About Eyestrain

Eyestrain is a common complaint of office workers, made more common in recent years by the widespread use of video display terminals (VDTs). Common symptoms experienced by VDT users and others whose jobs involve extensive reading include eye soreness, blurred vision and dry, itching or burning eyes. Fortunately, there are ways to adapt the work environment to make it less demanding on your eyes.

## Eye-Ease Tips

The following tips can help reduce eyestrain and prevent more serious vision problems:

- To reduce glare, position your VDT so that neither you nor the screen faces a window. If necessary, use a hood or glare-reduction screen.
- To lessen strain on eye muscles, keep your VDT screen 18 to 28 inches from your eyes, and no higher than eye level when you're seated in your chair. If you use a document holder, keep it at the same height as your screen.
- Use dimmer lighting around your VDT. Dim lighting reduces glare and makes the screen easier to read. Select lighting that won't reflect off the screen or other surfaces, and direct it so that it doesn't shine in your eyes.
- Adjust the screen's brightness and contrast controls for your best comfort. The screen should not be so bright that it flickers; the characters should not be so dim that they're difficult to see.
- If your screen has color options, choose those easiest on your eyes. Green or amber text on black background is recommended for extended VDT use.

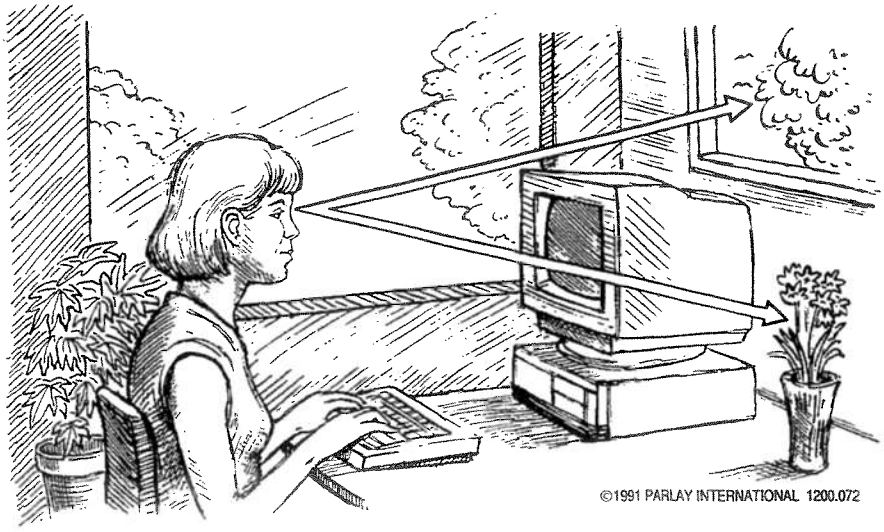
## Take a Rest

One of the best things you can do for your eyes when working on VDTs or in other eyestraining situations is to take short breaks. Simple one-minute eye exercises done every 20 minutes can reduce eye fatigue. Change focus by glancing across the room or look out the window and focus on objects at least 20 feet away. Then, lightly cup your eyes with your palms, and relax for 60 seconds. Or, look away from the screen, and roll your eyes up and down, around and side to side.

## Eye Exams

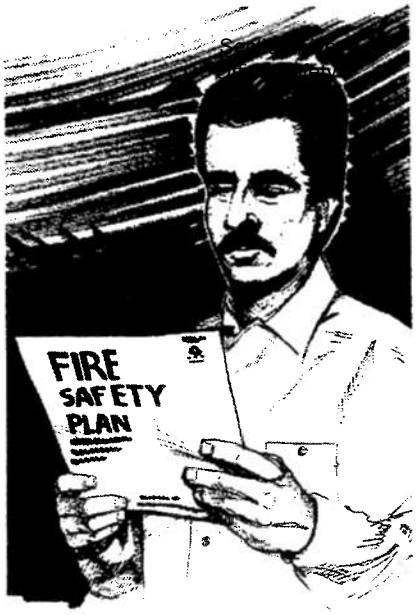
If you experience chronic eye problems, have your eyes examined by an eye care professional. If you work on a VDT, be sure to tell the doctor. Anyone who works regularly on VDTs should have annual eye exams, and people over age 40 may need more frequent checkups.

**Simple one-minute eye exercises can reduce eye fatigue. Change focus by glancing across the room or look out the window and focus on objects at least 20 feet away. Then, lightly cup your eyes with your palms, and relax for 60 seconds.**



# Fire Safe in The Office

*Thousands of fires break out in office buildings each year. These fires can be as destructive and deadly as industrial fires. Fortunately, most office fires can be prevented.*




***The best time to think about fire safety is before a fire starts. Be familiar with your company's fire escape plan and participate in all fire drills.***

## Office Fire Prevention Strategies

The key to fire prevention is learning how to recognize and avoid potential office fire hazards. Modern office buildings are often built of fire-resistant materials, but many of the interior features—such as wall insulation, furnishings, ceiling tiles—can burn. You can help prevent office fires by following these guidelines:

- Smoke only where permitted. Always use ashtrays; cigarettes left to smolder on furniture or in wastebaskets are a common cause of office fires. Be sure to fully extinguish butts, and empty ashtrays only when contents are cold.
- Heat-producing equipment—copiers, word processors, coffee makers and hot plates—is often overlooked as a potential fire hazard. Keep it away from anything that might burn.
- Electrical appliances can be fire hazards. Be sure to turn off all appliances at the end of the day. Use only grounded appliances plugged into grounded outlets.
- If electrical equipment malfunctions or gives off a strange odor, disconnect it and call the building's maintenance office. Promptly disconnect and replace cracked, frayed or broken electrical cords.
- Keep extension cords clear of doorways and other areas where they can be stepped on or chafed and never plug one extension cord into another.
- The most frequent cause of office building fires is arson. Report any suspicious-looking visitors. Keep exit doors closed and comply with rules that restrict unauthorized people from entering the building.

## Know Your Company's Escape Plan

The best time to think about fire safety is before a fire starts. Learn the location of fire escape routes and how to activate the fire alarm. Participate in practice fire drills at least once a year. During fire drills, practice crawling to each exit; because smoke rises, breathing is easiest near the floor. Become familiar with stairway exits—elevators may quit functioning during a fire, or may expose passengers to heat, gas and smoke.

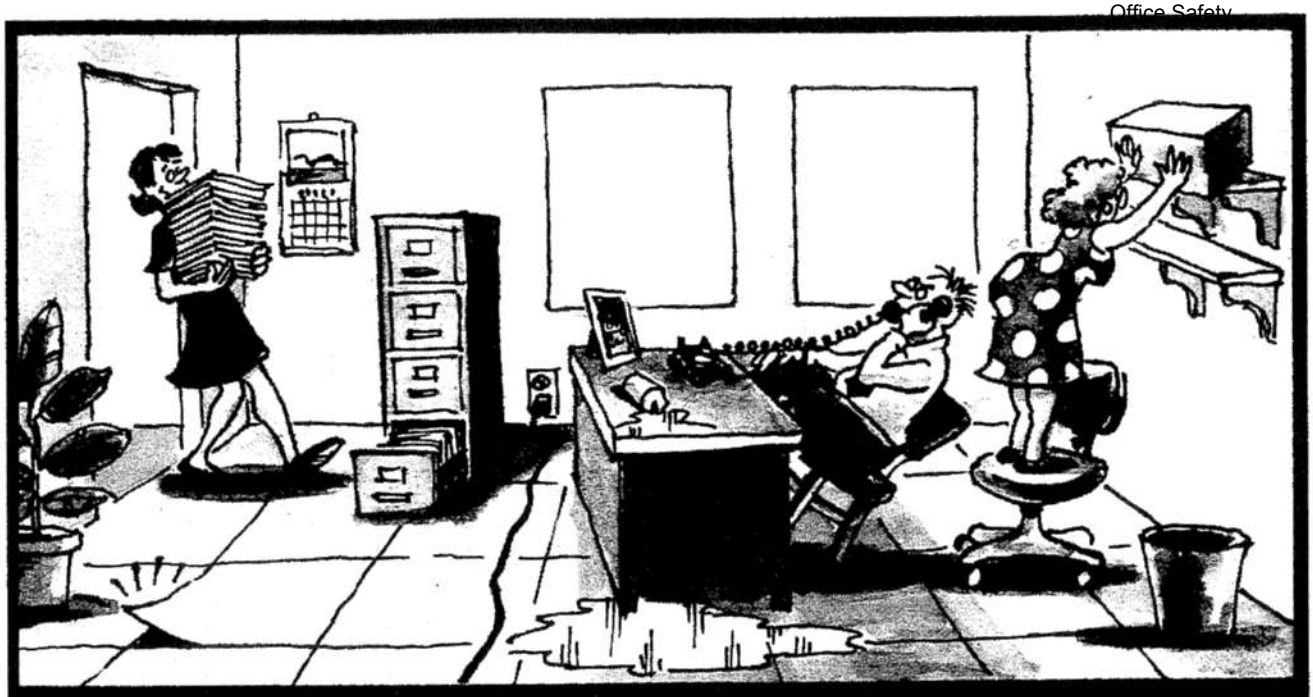
## Extinguish or Evacuate

Many small and self-contained fires can be safely extinguished on the spot with the appropriate fire extinguisher. Fire extinguishers are labeled according to the type or types of fires they can put out: "A" is for wood, paper and other combustibles; "B" is for flammable liquids, such as gasoline; and "C" is for electrical fires. Most offices are equipped with one or more fire extinguishers labeled "ABC."

In an emergency, you probably won't have time to figure out how your fire extinguisher works. Read your office extinguishers' labels. Study the instructions as part of your preparation plan. For your safety during a fire, use an extinguisher only if the fire is small, you have an escape route, you know how to use the extinguisher and you are certain the extinguisher is the right size and type for the fire. If you are in doubt about any of these factors, sound the alarm for evacuation immediately and call the fire department from outside your office building.

## Be Alert

A small investment in awareness and advance planning can help make your office a fire-safe place to work. Your life is worth the time!



There are seven fall hazards in this picture. Can you find them?

# No-Fall Insurance

Falls are the most common office accident and often result in disabling injuries. Seemingly innocent office conditions—a small coffee spill in the hall, a frayed edge of carpet—can cause a serious fall. Learning to recognize and correct slip, trip and fall hazards is your best insurance.

## Slips, Trips and Falls

A fall can occur when your balance is thrown so far off center that you lose your footing. Some falls result when your feet lose friction and slip, or when your foot strikes an object and you trip. In either case, any serious loss of footing leaves you nowhere to go but down.

## Common Hazards

One of the most common causes of office falls is tripping over an open drawer. Bending or leaning over while seated in an unstable chair, slipping on wet floors and tripping over electrical cords are other common hazards. Loose carpeting, objects stored in halls or on stairs, poor lighting, improper footwear and using makeshift "ladders" (such as a chair or stack of books) are other hazards that invite falls.

## If You Fall

If you find yourself heading for a fall, remember—roll, don't reach! By letting your body crumple and roll, you are more likely to absorb the impact and momentum of a fall without injury. Reaching an arm or leg out to break your fall may result in a broken limb instead.

## FALL-PREVENTION CHECKLIST

- ☞ Be sure your pathway is clear before you walk.
- ☞ Close drawers completely after every use.
- ☞ Avoid bending, twisting and leaning backward while seated.
- ☞ Secure electrical cords and wires away from walkways.
- ☞ Always use a stepladder for overhead reaching.
- ☞ Clean up spills immediately.
- ☞ Pick up objects co-workers may have left on the floor.
- ☞ Report loose carpeting or damaged flooring.
- ☞ Make sure walkways are well-lit.
- ☞ Never carry anything that obscures your vision.
- ☞ Wear stable shoes with non-slip soles.
- ☞ Don't run indoors!

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  - What was the violation?
  - What hazard did it create?
  - What injury could have occurred?

- Review upcoming work schedule-
  - What hazards are you concerned about?
  - What safety equipment should be used?
  - What procedures should be followed?

**The Place and Time**

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Hold a toolbox meeting once a week to reinforce your company" philosophy that job safety is important.

We hope our toolbox talks help you in the daily operations of your business. Keep them handy. Like any tool, they can" help unless you use them. If you have any questions, contact your EHS representative.

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**Date:** _____

**Conducted By:** _____

**Topic:** _____

_____

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**Attendees:**

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FIRST AID FOR . . .

# PUNCTURES AND IMPALED OBJECTS

The nature of accidents is that they are unexpected. That's why Jim wasn't prepared for his. One day he was careless. Suddenly, his hand slipped and the drill bit punctured his hand. If you were in this situation, you could use first aid to prevent Jim from going into shock, even from death.

## Puncture First Aid

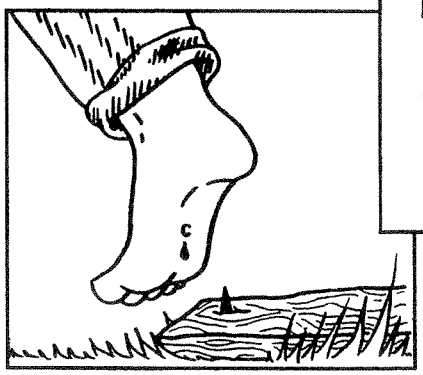
A puncture is a hole poked into a body part. A puncture wound could happen at work or at home, in the shop or in the kitchen. A small puncture should be allowed to bleed, so if something has been forced into the wound, it can flow out. But call a doctor even for a small puncture wound. It can get infected and you may need a tetanus shot if it's been too long since your last one.

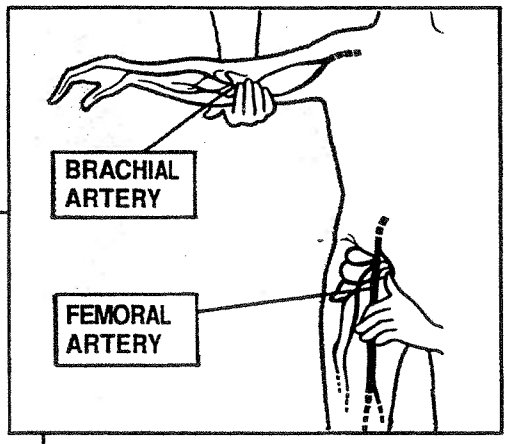
If the wound is very deep, and won't stop bleeding, call for medical help right away. Then, take steps to control the bleeding. Using a sterile bandage or clean cloth, push very firmly directly on the wound. Wrap a bandage over the wound and tie it tightly. Keep pressure on the wound until medical help arrives. If you can't find a clean bandage or cloth, use your hands. If there are no broken bones, keep the injured body part higher than the victim's heart. Lay the victim down and keep him or her at rest. (If there are broken bones, do not move the limb.)

If bleeding is still out of control, continue to keep pressure on the wound, while pressing on the artery

**If bleeding is out of control, push on the pressure point for that part of the body.**

**Allow small puncture wounds to bleed. Then see a doctor for a tetanus shot.**






that gives blood to that area of the body (see illustration). The pressure point for the arm is on the inside of the arm on the same side of the body as the injury. For the leg, it's on the inside of the groin on the same side of the body as the injury.

## Impaled Object

An impaled object is something that is stuck into the body. Any object impaled in a person causes a puncture wound. It's important not to try to remove the object. Control bleeding by pressing around the object with a clean dressing or your hand. If bleeding is out of control, push on the pressure point for that part of the body (see illustration).

## If It's Life Or Death

It doesn't happen often, but sometimes an injury is so severe that the suggestions above don't stop bleeding. If you feel it is a life and death situation, you may need to use a tourniquet. A tourniquet is a special way to wrap a body part tightly so that blood can't get through that part at all. If you must use a tourniquet, do not remove it—let a professional medical person do that. Otherwise, the victim may suddenly go into shock, a blood clot can be loosened, or the victim may even die.

To apply a tourniquet, tightly wrap a wide piece of cloth, towel, or other fabric just above an arm or leg wound. Never use wire, string, or anything that could cut the victim's skin. Wind the cloth around the limb two times. Tie the cloth in a knot. Put a stick in the knot, and tie two more knots to keep the stick in place. Then, twist the stick until the bleeding stops and leave it twisted tightly.

Then, treat the victim for shock—keep the victim warm, not hot, and lying down. If there are no neck or spine injuries, place the person's legs on a blanket or pillow so they will be higher than the head.


# POISONING

Thousands of adults and children die each year from poisoning. Even eating, drinking, or breathing in something that seems safe can make you ill. Eight out of ten poison victims in the US are small children. They usually can't read labels or describe what it is they've swallowed. Know the dangers and symptoms of poisoning. Acting quickly and calmly may save a loved one's health and even life!

## Kinds Of Poisons

Drugs, cleaners, pesticides—even a small amount of these "primary" poisons can cause illness and death. Lotions, sprays, certain plants, milder drugs including aspirin—"potential" poisons—can also make someone ill when taken in larger amounts.

## Protecting Children

Leaving potential poisons around, even where they seem safe, is dangerous. Small children love to explore and taste. At 6 months, they can open low cabinets. At 1 year, they can often climb to counter tops. At 2 years, they can often reach medicine or liquor cabinets.


**Many common household items can be poisonous.**

*Never leave a potential poison where a child could reach it.* Put childproof locks on all cabinet doors. Buy products in child-resistant packages. Don't transfer containers. Labels, especially on household cleaners, give first aid poisoning information. Don't tell children medicine tastes good. When you're not looking, they'll want to try some. Don't buy items with lead-based paint. If old furniture has lead-based paint, watch to prevent your children from chewing it. Never leave a young child alone to go to the phone or answer the door, especially if there is a possible poison in the room.

## Adults Can Be Poisoned

There are four common poison dangers for adults. *Vapors and fumes* from cars and charcoal grills can be deadly. Always operate them with plenty of fresh air circulating. Carbon monoxide has no smell, color, or taste, but it can kill someone in a few minutes.

*Drugs*, even aspirin, can make you ill. Take only the amount directed by your doctor or the drug manufacturer. Never give left-over prescription drugs to anyone else. Read medicine labels in good light to be sure you're taking the right amount *and* the right medicine.

*Cleaners* can be dangerous, especially if they are not in their original containers and are mistaken for another product.

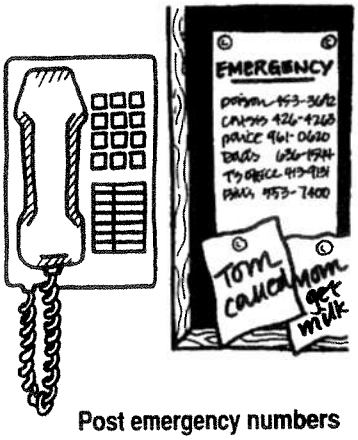
*Wild mushrooms* are often dangerous, since most varieties can be fatal if eaten. Unless you are a qualified expert, never eat mushrooms unless they come from the produce department of your grocery store!

## Signs And Symptoms

If you notice strange stains, smells, or behavior, or if cleaners or drugs are open near the victim, suspect poisoning. Any one of these symptoms may indicate poisoning: shallow breathing, convulsions or fits, excitedness, sleepiness, unconsciousness, mouth or throat burns, stomach pains, headache, or nausea.

## First Aid Now!

If you suspect poisoning, call the Poison Control Center, hospital, or doctor immediately. Give them the victim's age and weight, the name of the suspected poison, and how much was taken. Post emergency numbers where everyone can see them in several places around the house.




**Post emergency numbers where everyone can see them.**

FIRST AID FOR . . .

# HEART ATTACK

**Someone trained in CPR can greatly improve the victim's chances of surviving a heart attack.**

**HEART ATTACK SYMPTOMS**

- ❑ difficulty breathing, gasping
- ❑ pressure, tightness, squeezing, or sensation of fullness in the chest (especially if it spreads across chest to shoulder, arm, neck, or jaw
- ❑ nausea, vomiting, indigestion
- ❑ cold sweat or clammy skin
- ❑ pale or blue-looking skin, lips, or nails

Heart attack means the heart has stopped pumping blood. It is the leading cause of death in adults. But, if you know the symptoms and what to do first if heart attack strikes, you may be able to save the life of a friend, coworker, or loved one. It's a good idea to take a class in CPR (Cardio Pulmonary Resuscitation). With CPR training, older children and adults alike may be able to help a heart attack victim. A heart attack can happen anytime, and within 4-6 minutes death or serious damage can take place. But, someone trained in CPR can greatly improve the victim's chances of surviving a heart attack.

## Symptoms Of Heart Attack

There are many possible symptoms of heart attack. The more symptoms a person has, the more likely it is that he or she is having a heart attack. Even if a person has only one or two symptoms, though, it's important to seek medical attention as soon as possible. The most common symptoms of heart attack are listed in the box above.

## What To Do

Call an ambulance immediately. If the victim is conscious, help him or her to a sitting position. Keep the victim warm and comfortable, using pillows for support and loosen tight clothing (especially collars). Ask if the person is taking medication and if you can get it for him or her. If the person is unable to speak, look for an emergency medical ID card or bracelet. If breathing has stopped, give mouth-to-mouth resuscitation. If breathing and pulse have stopped, and if you are trained, perform CPR.

## Preventing Heart Attack

There are many things you can do to lessen your risk of suffering a heart attack. Speak with your doctor if you have questions about how to:

- ❑ quit smoking
- ❑ avoid fatty foods
- ❑ exercise regularly
- ❑ reduce stress, learn to relax
- ❑ control blood pressure
- ❑ reduce serum (blood) cholesterol

# Save Your Skin

Protecting your skin from skin disease can be tricky—it requires a combination of the right personal protective equipment (PPE) for the chemicals you use and careful and thorough cleanup procedures. Your best skin protection is knowledge: Read warning labels and MSDSs and follow them rigorously, whether or not the chemical seems to bother your skin.

## Protect Your Hands

Since your hands are the parts of your body most likely to come in contact with a hazardous chemical, you must be extra careful to protect them. Use the right gloves or protective hand creams—the wrong ones may dissolve in the chemical you use! If you find that the gloves themselves irritate your skin, wear cotton glove liners, and keep gloves and liners clean, both inside and out. If you use a skin cream for moderate protection of your hands, use the one recommended by your supervisor or company policy. Some creams resist water-based chemicals such as acids and bases, while others guard against solvents only. Apply skin cream often—don't rely on one thick coating that could make your hands greasy and slippery. Remember that skin creams will not protect your skin from heavy exposure to a chemical. And be sure to wear appropriate PPE to protect your body.

## Preventive Maintenance

You can avoid conditions leading to skin damage by keeping your body and your workplace clean. Remember, the longer and more often your skin is exposed, the more likely it wil be damaged. Showering daily with nonirritating soap keeps chemicals from staying on your skin. Avoid washing with harsh detergents or cleaning up with solvents. Wash your work clothes, including underwear, every day, and keep them separate from other laundry. Keep your work area clean and well ventilated, change rags often, and keep cleaning materials handy.

## Some Chemicals Can Burn

When corrosives such as acids or caustics are accidentally spilled on your skin, you must act quickly to prevent a burn. Immediately flush the exposed area with water for at least 20 minutes. Remember, every second counts. Get into the shower, if required, before removing contaminated clothes. Get medical attention for accidental spills on skin, especially if the skin becomes inflamed and sore.

## Treating Skin Damage

Remember that chronically irritated skin allows dangerous chemicals to enter your body. For your own health and safety, seek medical attention for skin irritation that persists. Then follow the full course of treatment, even if the skin condition seems to be healed.

Neglecting your skin is "rash behavior." No matter what chemicals you work with, you can keep your skin healthy by wearing protective equipment, keeping skin and work area clean, and learning the right procedures for each chemical you use.

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# Horseplay Is No Joke

Humor is an important part of life. People who work together and share a sense of humor are probably happier and more productive on the job. But when employees express their sense of humor through horseplay or practical jokes, they are inviting serious trouble.

## Humor Can Hurt...

Some people can laugh it off when they are the butt of a joke, but it's hard to tell how a practical joke is going to affect someone. Practical jokes that humiliate or embarrass others can result in anger, hurt feelings, a lack of trust between workers and even a desire for revenge.

## ...In More Than One Way

Practical jokes and horseplay can be safety hazards on the job. Startling or distracting a worker who is using dangerous equipment can have disastrous consequences. When practical jokes are common at a worksite, employees may not be paying enough attention to the work because they are on the lookout for the next joke. And horseplay that gets physical can quickly get out of hand and lead to injury or even death.

## Is It Worth It?

If you get hurt while engaging in horseplay, you may not be covered by worker's compensation because it is not a job-related injury. Even if you don't get hurt, you may lose your job if you break company rules. And if someone else gets hurt because of your horseplay, you may face a lawsuit, which could really put your sense of humor to the test.

## Keep It Light

Your sense of humor is an important asset. Using it wisely and with restraint at work will benefit you and all of those around you.

# Kitchen Hazards

The major section of restaurants and cafeterias involved in on-the-job injuries is, of course, the kitchen.

Perhaps the greatest offenders causing both major and minor injuries are knives, cleavers, peelers, and graters. It goes without saying that caution should be taken at all times. It's also a good idea to warn co-workers when you put anything sharp in wash water. "Knife in the water" is a common warning in many kitchen areas. Those four words can help prevent serious cuts and puncture wounds.

Food grinders are also hazardous. Never feed anything into them with your hands—use a pusher. Garbage disposals can present the same hazard. Don't reach into the disposal if it is stalled, without taking steps to prevent it from being turned on.

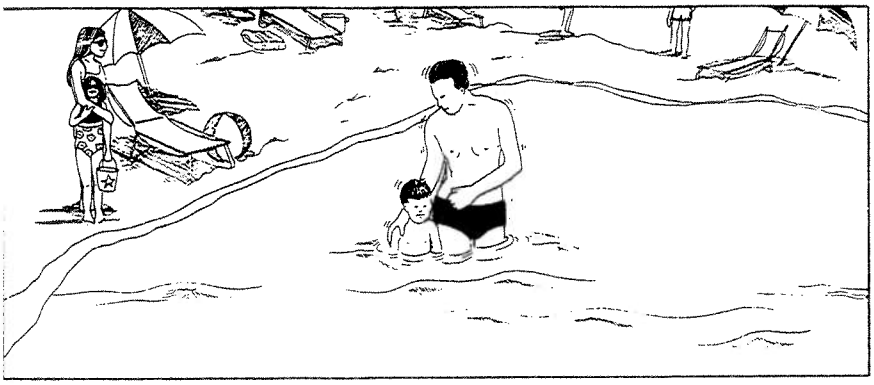
Meat and cheese slicers are particularly dangerous, and the temptation to hand feed, especially at the end of a piece of food, must be avoided. Meat band saws can be guarded up to a point. Use what guarding is provided and exercise extreme care and alertness when approaching the blade.

Spills and liquids on the floor cannot always be avoided, but there is no excuse for not wiping up spills immediately. When the floor is being mopped, put a warning sign or barrier nearby. Slips and falls have caused many permanent injuries. Putting down an antislip rug is another way to lessen the danger of falls.

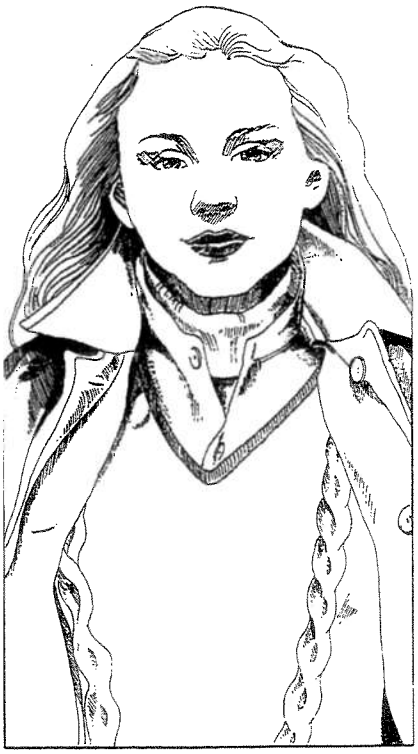
Much modern kitchen equipment is electrically operated. Be sure the equipment is properly grounded or double-insulated especially in kitchens, where water and moisture are plentiful. An electric shock can be serious or even fatal.

# PREVENTING "COLD STRESS"

## *Protecting Against Hypothermia*



**Even in warm weather, overexposure to cold water can cause hypothermia.**



**Layering your clothes allows you to adjust what you're wearing to suit the temperature conditions.**

When your body temperature drops even a few degrees below normal (which is about 98.6° F), you can begin to shiver uncontrollably, become weak, drowsy, disoriented, unconscious, even fatally ill. This loss of body heat is known as "cold stress" or hypothermia. Persons who work outdoors, or who enjoy outdoor activities should learn about how to protect against loss of body heat. The following guidelines can help you keep your body warm and avoid the dangerous consequences of hypothermia.

### Dress In Layers

Outdoors, indoors, in mild weather or in cold, it pays to dress in layers. Layering your clothes allows you to adjust what you're wearing to suit the temperature conditions. In cold weather, wear cotton, polypropylene, or lightweight wool next to the skin, and wool layers over your undergarments. In warm weather, stick to loose-fitting cotton clothing. For outdoor activities, choose outergarments made of waterproof, wind resistant fabrics such as nylon. And, since a great deal of body heat is lost through the head, always wear a hat for added protection.

### Keep Dry

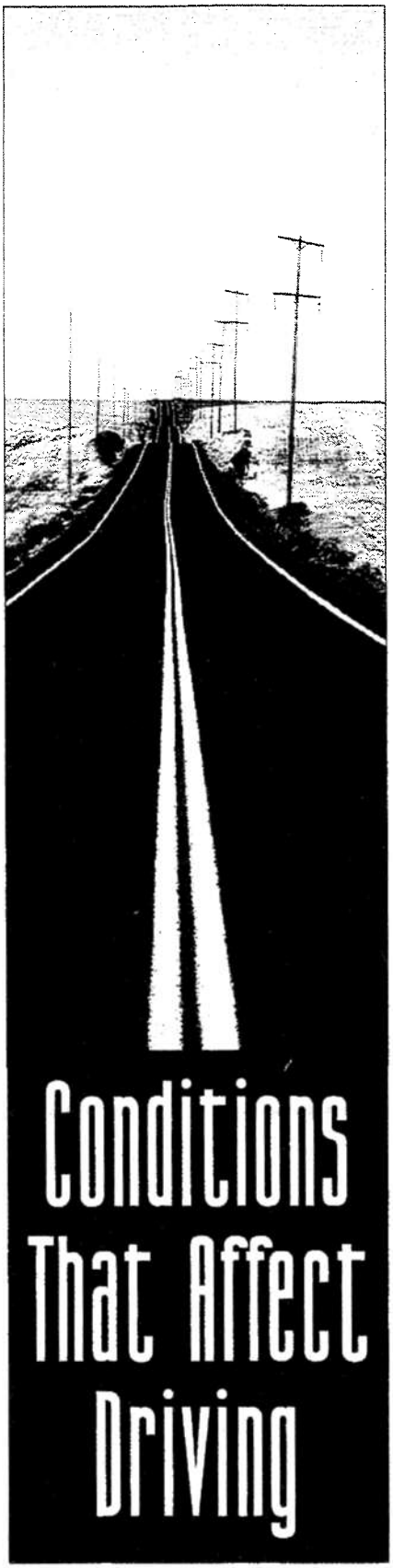
Water chills your body far more rapidly than air or wind. Even in the heat of summer, falling into a 40° lake can be fatal in a matter of minutes. Always take along a dry set of clothing whenever you are working (or playing) outdoors. Wear waterproof boots in damp or snowy weather, and always pack raingear (even if the forecast calls for sunny skies.)

### Take A Companion

The effects of hypothermia can be gradual, and often go unnoticed until it's too late. If you know you'll be outdoors for an extended period of time, take along a companion. (At the very least, let someone know where you'll be and at what time you expect to return.) Ask your companion to check you frequently for overexposure to the cold—do the same for your companion. Check for shivering, slurred speech, mental confusion, drowsiness, and weakness. If either of you shows any of the above signs, get indoors as soon as possible and warm up.

### Warmth and Understanding

The key ingredients to preventing loss of body heat are staying warm, and understanding what you can do to protect against conditions that can cause hypothermia. Hypothermia can be fatal, but it can also be prevented.



# Conditions That Affect Driving

The conditions of driving are constantly changing. Light, weather, road conditions, traffic and the condition of your vehicle all have to be taken into account when driving. Consider the conditions that might affect your next road trip, and how you can respond to them.

## Vehicle

- Tires in good shape and properly inflated?
- Area under engine free of leaks?
- Oil and other fluid levels adequate?
- Lights working properly?
- Brakes functioning?

## Light

- Driving at night? Slow down and increase following distance.
- Driving into the sun? Reduce your speed, and use your sun visor and sunglasses. Make sure your windshield is clean, both inside and out. Take the same precautions when driving in the glare of snow.

## Weather

- Rain, snow or fog causing poor visibility? Slow down and increase your following distance according to the extent of the hazard.
- Roads wet or icy? Add even more following distance. Slow down to avoid hydroplaning on wet roads or skidding on ice. Slow to a crawl if necessary and turn on your flashing lights. Avoid sudden moves or hitting the brakes hard.
- Wind? Steering and acceleration can be difficult in a headwind. Crosswinds can cause you to swerve suddenly. And tailwinds can boost your speed without your being aware of it. Slow down and take a firm grip on the steering wheel.

## Road

- Narrow or winding road with blind curves and intersections? Slow down and be alert for unexpected hazards such as stalled vehicles, vehicles entering from side roads or driveways and stopped school buses.
- Road flat, wide, and straight? Watch out for "highway hypnosis."
- Construction zone? Slow down and prepare to stop. Watch for changes in road surface. Obey instructions from road crew.

## Traffic

- Heavy city traffic? Scan the road for pedestrians, stopped vehicles, turning vehicles. Be prepared to stop.
- Fast-moving traffic? Move with the flow of traffic. On the freeway, drive in the right lane to avoid exceeding the speed limit.
- Many trucks and buses? Increase your following distance. Avoid passing if possible. Allow extra leeway when passing.

There's one other condition we haven't discussed here: the condition of the driver. To be safe in all driving conditions, never get behind the wheel unless you're calm, rested and sober.

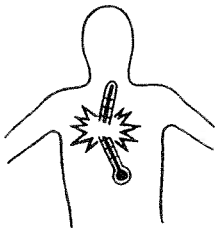
# THE HAZARDS OF HEAT

*A hot job, a hot day and high humidity—it all adds up to heat stress. And too much heat stress leads to heat illness, the body's way of saying it can't take the heat.*

*There are three kinds of heat illness—heatstroke, heat exhaustion and heat cramps. They can occur separately or in combination.*

## Heatstroke Happens When Sweating Stops

Heatstroke occurs when the body's heat-regulating system breaks down under stress and sweating stops. There may be little warning, and unless the victim receives quick treatment, death can occur.



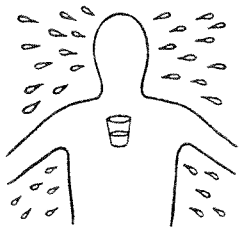
A heatstroke victim usually has red or spotted skin and a body temperature that reaches 105° F/41°C or higher. The victim may also suffer from confusion, convulsions or delirium before losing consciousness. Unless the victim receives treatment, death can occur.

If someone on your job has heatstroke, call an ambulance and move the victim to a cool place. Then thoroughly soak the person's clothing with cool water or place the person in a tub of cold water (do not add ice). When the victim's temperature has dropped, dry him or her off. It body temperature rises again, repeat the cooling process.

## When Body Fluids Get Low, Heat Exhaustion Sets In

Heat exhaustion develops when the body loses more fluid through sweating than it is taking in. A victim of heat exhaustion sweats profusely but becomes extremely weak or giddy. In more serious cases, the victim may vomit or faint. The skin becomes clammy and the complexion pale, but body temperature stays fairly normal.

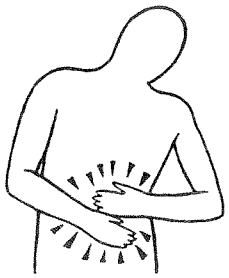
To treat a victim of heat exhaustion, have the person sip water for about an hour while lying down. Loosen any clothing and raise the victim's feet 8 to 12 inches. Then apply cool, wet cloths and fan the victim. If vomiting occurs, discontinue fluids and take the person to a hospital, where an intravenous solution can be administered.



## When the Body Loses Salt, Watch Out for Heat Cramps

Heat cramps are painful muscle spasms. The arms, legs and abdomen are usually affected first, but any muscles used when working are susceptible. Heat cramps strike those who sweat profusely and drink a lot of water but fail to replace body salt lost through sweating. Low salt content in the muscles causes painful cramps during or after work hours.

To treat a victim of heat cramps, press firmly with your hands on the cramped muscles or gently massage them to relieve the spasm. If the victim has no other medical condition, you may give the victim half a glass of salt water (one teaspoon of salt per glass of water) every 15 minutes for about an hour. Victims with other medical conditions should be seen by a doctor.



## Beat the Heat

**The best way to fight heat illness is to prevent it. Here are some tips to help you through hot times on the job:**

- **On your first day in a hot environment, expect to do only half the work you would ordinarily do. Each day, increase your workload until you are able to operate at full capacity.**

- **Drink lots of water. Sweating is one way your body cools itself. Since sweating results in water loss, the only way to replace the water is to drink more of it. Drink at least eight ounces of water every 20-30 minutes while working in a hot environment.**

- **Avoid alcohol and carbonated drinks, which can cause cramps.**

- **Wear protective equipment. Personal protective equipment (PPE) for hot environments can range from ordinary work clothes made from fabrics that "breathe" to specially designed suits that are cooled by air, ice and even portable air-conditioners. Check with your supervisor about the right PPE for your job.**