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Safety Sense

Plan ahead to avoid injury

There are many safety problems common to most workplaces that can be solved with a little bit of safety sense. Planning and thinking ahead can help eliminate most of these hazards. Take a close look at your workplace with the following suggestions in mind.

Get rid of trash. Organize a clean up program to remove trash, broken parts, and scrap from work areas, walkways, storerooms, and neglected corners. Look for materials that have been stacked improperly. An unstable stack is a real danger if the material suddenly falls. Check such things as wood pallets, dock freight, storeroom boxes, construction materials and even office files to see that materials are stacked properly.

Examine all the operations of your workplace to determine if personal protective clothing is needed, then make it easily available. Ear protection, eye protection, hard hats, gloves, safety shoes or other protective clothing and equipment appropriate to the hazard exposure must be worn.

Make sure all electric power tools are grounded. Protect yourself from electric shock by using tools with three-prong plugs and a ground-fault system, or double insulation. Never cut off the ground plug on a three-prong plug. Check electrical cords and wires for any damage. Guard power tools and moving machine parts. Tools and equipment should never be operated with the guards or shields removed.

Inspect portable ladders to make sure they are secure and don't shake or wiggle. Nonslip feet are a must. If a ladder seems weak, get rid of it – don't let others use a defective ladder. Mark it defective and throw it away.

Fire extinguishers are a must and should be mounted properly, readily accessible, and in working order. Check fire regulations to make sure they are properly placed and the right type for your work area. When was the last time your fire extinguishers were tested? Extinguisher inspections should be made regularly then tagged to show when and who performed the tests.

Exits should be clearly marked with easy to read signs placed above the doors. Signs with arrows should also be used to guide people to the exit if the layout of the workplace is confusing. Illuminated exit signs must be kept in working order at all times. Don't block exits or signs with vehicles or material. Another good idea is to mark doors that are not exits with "This is Not An Exit," or with the identification of the room, such as "Restroom," "Storeroom" or "Closet." Put rails on all stairways. The stairs themselves should be in good shape with nonskid treads. Repair those that are damaged or chipped.

Safety meetings are one of the most important parts of a good safety program, so hold them regularly. Impress upon every worker that it's important that they take every precaution to keep the workplace safe. Both employee and employer attitudes toward safety provide a key to a successful safety program. Posters, handouts, and training programs can all be part of your safety communication.

Carbon Monoxide Poisoning

A colorless, odorless, relentless killer

Carbon monoxide (CO) is a colorless, odorless and tasteless gas that is slightly lighter than air. It is sometimes called carbonic oxide, exhaust gas or flue gas.

Carbon monoxide is produced by the incomplete combustion of any fuel that contains carbon. This includes gasoline, natural gas, oil and propane, as well as coal and wood products. Sources of CO include gas and oil burning appliances like furnaces, dryers, water heaters, ovens, wood burning stoves, charcoal grills, gas powered forklifts and automobiles.

Carbon monoxide is a chemical asphyxiant. When CO is inhaled into the lungs, it bonds with hemoglobin in the blood—hemoglobin is responsible for carrying oxygen throughout the body. The CO replaces the oxygen molecules in hemoglobin and deprives the heart, brain and body of the oxygen it needs to function. High concentrations of CO will displace enough oxygen in your body, resulting in oxygen starvation.

The symptoms of low level CO poisoning include headaches, nausea, weakness, dizziness and confusion. CO exposure causes a victim's blood pressure to rise in an attempt to get more oxygen to the body. As a result, the skin may take on a reddish color. The symptoms at low levels are very similar to what a person might exhibit if affected by the flu or other common illnesses. Therefore, carbon monoxide is sometimes referred to as the "Great Imitator."

As CO exposure increases, more serious symptoms develop; lack of coordination, chest pain, vomiting and loss of consciousness. If exposed to carbon monoxide long enough, coma and death can occur. A concentration of 1200 ppm CO is considered IDLH (Immediately Dangerous to Life or Health). The table lists common symptoms and effects on healthy adults at various carbon monoxide concentrations.

Carbon Monoxide Level in ppm (Parts per Million)	Resulting Conditions/Effects on Humans
25	Permissible Exposure Level (PEL) for 8 hours (Cal-OSHA)
200	Possible mild frontal headache in 2 to 3 hours
400	Frontal headache and nausea after 1 to 2 hours; Occipital headache (back of head) after 2 to 3 hours. Max. exposure ceiling (Cal-OSHA)
800	Headache, dizziness, and nausea in 45 minutes; Collapse and possible death in 2 hours
1,600	Headache, dizziness, and nausea in 20 minutes; Collapse and possible death in 1 hour
3,200	Headache and dizziness in 5 to 10 minutes; Unconsciousness and danger of death in 30 minutes
6,400	Headache and dizziness in 1 to 2 minutes; Unconsciousness and danger of death in 10 to 15 minutes
12,800	Immediate effects: unconsciousness; Danger of death in 1 to 3 minutes

Due to the common sources of carbon monoxide and the inherent dangers, detection of carbon monoxide is crucial. Common methods of monitoring the presence of carbon monoxide include detector tubes, diffusion tubes, color badges, portable gas monitors and household or industrial fixed-gas monitors.

Portable CO Detectors monitor the current level of CO. Most of these monitors have a digital readout as well as visible and audible alarms. When the concentration of CO reaches a preset level, the instrument's alarm will activate. Portable alarms are commonly used in industrial settings where ongoing CO exposures are tracked as well as for monitoring air quality before and during confined space entries. When monitoring confined space entries, a multi-gas detector with an oxygen sensor, a combustible sensor and the appropriate toxic gas sensors should be used.

Fixed-Location Detectors are commonly used in industrial settings to monitor the ongoing concentration at a fixed point or source. They are mounted in one location and are equipped with visible and audible alarms. These devices can be set up to read the concentration at the control box or be used in con-junction with transmitters to detect CO in remote areas. Another common feature of fixed detectors is a relay device which is designed to signal certain events during an alarm condition (e.g., opening a door or turning on an exhaust fan).

Fixed CO detectors are also commonly found in homes. These detectors are much less sophisticated, but just as important as the industrial models. The Consumer Product Safety Commission (CPSC) recommends installing at least one carbon monoxide alarm with an audible warning signal near the sleeping areas in your home. If your home has multiple levels, additional detectors might be necessary.

Regardless of what your situation is, it is important to be aware of the dangers of carbon monoxide and the ways you can protect yourself. The following are a few suggestions to help protect against CO poisoning:

1. Install carbon monoxide monitors in your business and your home.
2. Educate yourself and your family on the effects of CO poisoning.
3. Check gas appliances periodically for proper operation and venting.
4. Ensure chimneys, flues and vents are free and clear of debris.
5. Do not use unvented gas and wood stoves or charcoal grills indoors.
6. Do not run automobiles or other gas powered equipment indoors without proper exhaust ventilation.
7. Ventilate areas to dilute or reduce the concentration of CO.

PPE Checklist

PPE only works if you wear it

Do you:

☑ Know the hazards of your job and which PPE you need to keep safe?
☑ Always use the PPE provided just the way you've been taught?
☑ Check your PPE before *each* use to make sure it's in good condition?
☑ Make sure you get a good fit?
☑ Report any problems with PPE to your supervisor right away?
☑ Remove dirty PPE carefully so that you don't contaminate yourself?
☑ Take care of your PPE?
☑ Immediately replace PPE that is worn, damaged, or defective?
☑ Ask your supervisor if you have any questions about your PPE?

REMEMBER: Your PPE won't protect you if you're not wearing it!

Hazardous Materials

What you need to know

Hazardous materials are just about everywhere these days, and millions of workers are exposed to them on the job. There's a lot you need to know about the materials used and stored in our workplace, beginning with the form in which you might find them. Materials come in three basic forms:

- **Solids** such as powders, dusts, fumes, and fibers
- **Liquids**, including both fluids and mists
- **Gases and vapors** that are given off by solid or liquid chemicals

Whether they're solid, liquid, or gas, hazardous materials present two basic hazards—physical and health hazards.

Materials with **physical hazards** include those that are:

➲ **Flammable,** meaning that they catch fire easily. Examples are gasoline, propane, and oil-based paints.

➲ **Explosive,** meaning they can explode, such as materials in aerosol cans.

➲ **Reactive,** meaning they can react dangerously if they come into contact with another material. Sometimes, even contact with air or water can cause a violent reaction.

Materials with **health hazards** include those that are:

➲ **Corrosive,** meaning that they can eat away or otherwise damage other substances, including your skin.

➲ **Toxic,** meaning that they are poisonous and can make you sick or kill you.

To protect yourself from hazards, you need to do four important things:

1. **Inform yourself about material hazards and precautions** by reading container labels and consulting the material safety data sheet (MSDS) for every material with which you come in contact.
2. **Wear required personal protective equipment (PPE),** such as gloves, eye protection, and respirators, and inspect your PPE carefully before each use.
3. **Follow established work procedures** and ask questions if there's anything you don't understand.
4. **Take advantage of ways to minimize exposures,** such as using ventilation and following the guidelines established by exposure limits (PEL, TLV, TWA, STEL - see sidebar) listed in the MSDS.

SAFE EXPOSURE LIMITS

To guard against dangerous health effects from hazardous materials in the workplace, scientists have identified exposure limits for different kinds of materials. Generally, these limits are the maximum amount of a material that you can be exposed to without possibly suffering negative health effects. Here's a rundown on the exposure limits, which you'll find in the MSDS:

⇨ **Permissible exposure limit (PEL)** is often expressed as the quantity of a hazardous material that an average person can safely be exposed to in an 8-hour workday. This is kind of like your doctor telling you to take one pill every 8 hours. If you take two pills in an 8-hour period, you are technically overdosing and could suffer some side effects. We keep exposure levels below the PEL with safety controls such as ventilation and PPE. The limits are usually expressed in parts per million (ppm) or milligrams per cubic meter of air (mg/cu meter).

⇨ **Threshold limit value (TLV)** is another way of looking at exposure limits. It's similar to the PEL and, in fact, the TLV is the model on which the PEL is based. TLV is the amount of a material in the air that almost all healthy adult workers are predicted to be able to tolerate without adverse health effects.

⇨ The exposure limits may be measured over an 8-hour workday **(time-weighed average, or TWA),** or over a very short term of exposure **(short-term exposure limit, or STEL).**

"Oh man – check out the label! You got isopentyl mercapton, methyl crotyldisulfide…"

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