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Construction Ergonomics: Carpentry Best Practices

Carpentry tasks that you regularly perform can lead to fatigue, discomfort, pain, and even injury. Awkward postures, repetitive motions, contact pressure, vibrating equipment, and lifting can all lead to injuries to your body.

Awkward postures. Your posture, or the position of your body, can contribute to fatigue or injury to your back, neck, and shoulders. If you are working near the ground, consider sitting or kneeling instead of bending or squatting. Another awkward posture is reaching. To avoid reaching, position yourself closer to the work by using a lift, scaffold, or ladder.

Repetitive motions. Repeating the same motion, like when hammering, can cause fatigue. To avoid fatigue, take small breaks. Regular breaks that last even only a few seconds are helpful. Also, when possible, use lightweight tools.

Contact pressure. If you kneel for extended periods of time, like when installing a deck, your knees can become irritated or inflamed. Wearing knee pads can make this type of work more comfortable for you.

Vibrating equipment. Hand tools such as drills, grinders, and sanders can cause hand-arm vibration. This vibration could result in a tingling sensation or numbness in your fingers, or you may see a change in the color of your hands or fingers. When using hand tools, grasp them as lightly as possible while still maintaining control of the tools.

Lifting. Improper lifting can lead to back sprains, strains, and herniated disks. When lifting, use mechanical equipment, like carts or hand trucks, to reduce the stress on your back from manual lifting.



Confined Space Hazardous Atmospheres

There are three types of atmospheric hazards that cause the most deaths and injuries in confined spaces:

- Oxygen deficient or oxygen displaced
- Flammable or combustible gas
- Toxic gas or vapor

“Oxygen Deficient” means any atmosphere that contains less than 19.5 percent oxygen. Another common name is “asphyxiating atmosphere.” Below that, your body won’t get the oxygen necessary to function properly, and a very low oxygen deficiency will cause asphyxiation and death. Normal air is 21 percent oxygen.

Flammable Or Combustible Gases in high concentrations cause explosions. An atmosphere is considered hazardous when the flammable gas or vapor concentration is above 10 percent of its lower flammable limit (LFL). The confined space permit should have the LFL information on it, as well as the safety data sheet for the gas. Natural gas and methane are examples; some gases like methane can be both an explosion hazard and an oxygen-deficiency hazard, depending on their concentrations.

“Toxic Atmospheres” refer to those containing gases, vapors, or fumes that have poisonous effects in or on the body. The most common toxic gases found in confined spaces are carbon monoxide and hydrogen sulfide, which can be inhaled.

If you believe you are or might be exposed to a hazardous atmosphere that you are not fully equipped for or trained to handle, leave the space immediately. If you or the attendant notices any signs or symptoms that an entrant is exposed to a hazardous atmosphere, immediately order the entrant to evacuate. Start nonentry rescue if the entrant does not respond, and call rescue services if the nonentry rescue fails.

Read the confined space permit, and make sure it is the most up-to-date version. Never enter a confined space with a known or suspected hazardous atmosphere without an approved and up-to-date entry permit and all of the protective equipment and procedures described in the permit.

The permit will describe the hazards of the space, including atmospheric hazards, entrapment potential, engulfment potential, required hot work permits if welding is to be done, and other planned work activities that can create hazards in the space. The permit will also show the results of air-monitoring tests that were conducted, so authorized entrants can be assured that the space is safe.

In some cases, the attendant may be required to monitor the concentrations of oxygen and hazardous chemicals, or it may be someone else; the permit will designate the appropriate person. The permit will tell you what type of respiratory equipment and personal protective equipment is needed and the type and frequency of monitoring that’s required. The permit will also describe the rescue procedures, as well as how to contact the trained confined space rescue team.

Never attempt to rescue a coworker unless you’re part of a trained rescue team. One-half of all workplace deaths related to confined spaces are would-be rescuers, and many of those deaths involved exposure to a hazardous atmosphere. Remember that the rescuer will be exposed to the same hazardous conditions that caused the entrant to need rescue.

Dry Ice Handling, Storage, And Disposal

Always read the safety data sheet (SDS) before working with dry ice or any hazardous chemical. Next, make sure you have all the appropriate personal protective equipment (PPE). PPE will include protective gloves that are loose-fitting and thermally insulated. You must also wear safety shoes and safety glasses with side shields. In addition, a self-contained breathing apparatus (SCBA) must be used if the dry ice creates an oxygen-deficient atmosphere.

When handling dry ice, avoid inhalation, eye contact, and skin contact. Never handle dry ice or objects in contact with dry ice with your bare hands; use appropriate gloves or dry ice tongs. Dry ice should never be placed on a tile or a laminate surface.

Dry ice should be stored in insulated containers, such as a Styrofoam, that open from the top. The lids should fit loosely so the carbon dioxide gas can escape to the atmosphere as the dry ice sublimates. Do not use metal, plastic, or glass containers, and never use a sealed or screw-top container. Dry ice containers must be stored in well-ventilated areas but never in an enclosed space, such as a basement, a walk-in freezer, a refrigerator, or an automobile. Carbon dioxide is heavier than air and will accumulate in low-lying areas, so ventilation must be at floor level.

When you are ready to dispose of dry ice, put it in a well-ventilated area—a fume hood, for example—and allow it to sublime. Never put it in a trash can, sink, or toilet.



Corrosives—Dangers of Exposure: QUIZ

1. Bases are flammable. TRUE or FALSE.
2. Corrosives can react violently if they come in contact with other chemicals, combustible materials, or water. TRUE or FALSE.
3. Most corrosives are which of the following?
 - A. Acids
 - B. Bases
 - C. Oxidizers
 - D. Either A or B
4. You can be exposed to corrosives by which of the following?
 - A. By breathing
 - B. By swallowing
 - C. By splashes to your eyes
 - D. All of the above

ANSWERS

1. FALSE. 2. TRUE. 3. D. 4. D.

Corrosives – Dangers of Exposures

Corrosive materials are highly reactive, unstable substances that can cause serious injuries if not handled in the right way. Most are either acids or bases.

- Acids are often used for cleaning solutions and in manufacturing. They can destroy body tissue.
- Bases are also widely used in cleaning agents and various other products. They can cause severe burns, lung damage, and scarring.
- In addition, some oxidizers, such as fluorine and chlorine, have corrosive properties.

You can be exposed to corrosives:

- **By breathing.** Even small amounts of corrosive vapors or particles can irritate and burn your nose, mouth, throat, and windpipe; larger amounts can cause severe lung damage.
- **By swallowing.** Swallowing corrosives accidentally can severely damage your mouth, throat, or stomach and, in some cases, can result in an inability to swallow or even cause death.
- **By splashes to your eyes.** A mist or even a splash of a corrosive can damage eyes. It may only cause irritation but scarring and blindness can also happen.
- **By contact with your skin.** Corrosives that touch your skin can produce irritation such as burns or blisters.

Corrosives are also highly reactive chemicals that can cause fire or explosion or react violently if they come in contact with other chemicals, combustible materials, or even water.

Acids react with many metals to release hydrogen, a highly flammable gas that can ignite in air.

Bases are not flammable, but intense heat develops when a solid base is dissolved in water, sometimes causing boiling and spattering over a wide area.

Used Oil Management: QUIZ

1. Used oil regulations define used oil as any oil refined from crude oil, or any synthetic oil, that has been used and, as a result of use, is contaminated by chemical or physical impurities. TRUE or FALSE.

2. Used oil and waste oil are interchangeable terms. TRUE or FALSE.

3. Farmers who generate an average of ___ gallons (gal) or less per month of used oil from the vehicles or machinery used on the farm in a calendar year are excluded from Environmental Protection Agency (EPA) used oil management regulations.

- A. 5 gal
- B. 10 gal
- C. 15 gal
- D. 25 gal

4. Which of the following statement(s) applies if your state regulates used oil as a hazardous waste? Choose all that apply.

- A. You must comply with the state's hazardous waste regulations.
- B. You must comply with the EPA's used oil management regulations.
- C. Used oil may be disposed of instead of recycled.
- D. Used oil must be recycled instead of disposed of.

5. Household do-it-yourselfers must comply with EPA used oil management regulations. TRUE or FALSE.



Used Oil Management

The U.S. Environmental Protection Agency (EPA) used oil regulations define used oil as any oil refined from crude oil, or any synthetic oil, that has been used and, as a result of use, is contaminated by chemical (e.g., fuel, certain molecular level metals, solvents, halogens, or water) or physical (e.g., metal fines, sawdust, dirt) impurities. Excluded from the used oil management regulations are:

- Materials containing or otherwise contaminated with used oil, provided that the materials are not burned for energy recovery and the used oil has been properly drained or removed to the extent possible such that no visible signs of free-flowing oil remain in or on the material.
- Mixtures of used oil and diesel fuel mixed by the generator or an "aggregation point" for use in their own vehicles.
- Materials reclaimed from used oil that are used beneficially and are not burned for energy recovery or used in a manner constituting disposal (e.g., rerefined lubricants).
- Materials derived from used oil that are disposed of or used in a manner constituting disposal.
- Used oil rerefining distillation bottoms that are used as feedstock to manufacture asphalt products (such distillation bottoms are also exempt from hazardous waste regulations).
- Wastewater contaminated with *de minimis* quantities of used oil.
- Used oil introduced into crude oil or natural gas pipelines; *and*
- Used oil produced on vessels from normal shipboard operations (until it is transported ashore).

All generators, processors/rerefiners, transporters, burners, and marketers of recycled used oil (used oil handlers) must comply with EPA used oil management regulations, with the following exceptions:

- Household do-it-yourselfers.
- Vessels generating oil at sea or
- Mixtures of used oil and diesel fuel mixed by the used oil generator for use in the generator's own vehicles once the used oil and diesel fuel have been mixed. Before mixing, the used oil is subject to the used oil management regulations.
- Farmers who generate an average of 25 gallons (gal) or less per month of used oil from the vehicles or machinery used on the farm in a calendar year.
- Wastewater treatment units that are losing a *de minimis* amount of used oil. (These units are regulated under the Clean Water Act.)

Used Oil vs. Oily Waste: Used oil and waste oil are not interchangeable terms because waste oil, or oily waste, does not always meet the definition of used oil. For example, bottom waste from an oil storage tank may be contaminated with impurities, but the material has never been used.

Hazardous Waste: A few states regulate used oil as a hazardous waste. If your state manages used oil as a hazardous waste, you must comply with the state's hazardous waste regulations, and therefore, the used oil regulations would not apply. In addition, despite the EPA's preference that used oil be recycled in accordance with the used oil regulations, it may be disposed of provided it is done so in accordance with the hazardous waste regulations (if the used oil is a listed or characteristic hazardous waste) or the solid waste regulations (if the used oil is nonhazardous).

Used Oil Management: ANSWERS

1. **TRUE.** Used oil regulations define used oil as any oil refined from crude oil, or any synthetic oil, that has been used and, as a result of use, is contaminated by chemical or physical impurities.
2. **FALSE.** Used oil and waste oil are not interchangeable terms.
3. **D.** Farmers who generate an average of 25 gal or less per month of used oil from the vehicles or machinery used on the farm in a calendar year are excluded from EPA used oil management regulations.
4. **A. & C.** If your state regulates used oil as a hazardous waste, you must comply with the state's hazardous waste regulations, and the used oil may be disposed of instead of recycled.
5. **FALSE.** Household do-it-yourselfers are excluded from complying with EPA used oil management regulations.

SDHESRLLTIN
ZRI LSWO IHSR
CHEMICALNMO
OSULDQNSLCN
NHINZNUSTOC
SIZCOQUIEEU
EIAUCIRHDEE
RSUCVUELTUU
VELSNAIATR
ENVIRONMENT
HAZARDOUSED

used
oil
hazardous
waste
environment
conserve
chemical
liquid

World Conservation Day 2022

World Conservation Day is celebrated each year on July 28 to acknowledge that the foundation for a healthy society is a healthy environment. It's also a day to increase awareness about the importance of protecting our natural resources and encourage people to live a more sustainable life. Water, air, soil, wildlife, and minerals are examples of natural resources. Conservation is focused on protecting species from extinction, enhancing ecosystems, protecting biological diversity, and maintaining and restoring habitats.

To conserve natural resources, you can:

- **Use Less Water.** Taking shorter showers or turning off the faucet while brushing your teeth can reduce water waste in your home.
- **Turn Off The Lights.** Turn off any lights or televisions after you leave a room. Unplug appliances like portable air conditioners, toasters, and coffee makers when not in use.
- **Recycle.** Making new products requires the use of resources, but recycling helps reuse the materials we already have. Switch to paperless billing and buy recycled paper to limit the need for logging and deforestation.
- **Choose Reusable Goods.** Avoiding single-use plastics is another way to conserve resources. Instead of buying water bottles, plastic cups, or paper plates, opt for ceramic, metal, or glassware. Use your own fabric grocery bags rather than plastic bags.
- **Manage Your Thermostat.** Heating and air conditioning make up approximately half of your energy bill but lowering the heat by just two degrees in the winter can help conserve energy in your home. Raising the thermostat two degrees in the summer will also have energy-saving effects and help reduce your monthly bill.:



Chemical spotlight: Cyclohexanethiol

Cyclohexanethiol is a colorless liquid with a strong, offensive odor. It is used as a chemical intermediate, in pesticides, and in synthetic rubber processing. Store cyclohexanethiol in tightly closed containers in a cool, well-ventilated area. Cyclohexanethiol is not compatible with oxidizing agents, strong acids, reducing agents, and alkali metals. Sources of ignition, such as smoking and open flames, are prohibited where cyclohexanethiol is used, handled, or stored in a manner that could create a potential fire or explosion hazard.

If cyclohexanethiol is spilled or leaked, avoid breathing vapors, mist, or gas, and ensure adequate ventilation. Remove all sources of ignition and evacuate personnel to safe areas. Use personal protective equipment (PPE), including goggles or safety glasses, gloves, flame-retardant protective clothing, and respiratory protection.

Prevent further leakage or spillage if safe to do so, and do not let the product enter drains, sewers, underground or confined spaces, groundwater, or waterways or discharge into the environment. Absorb liquids with an activated charcoal absorbent, and deposit in covered containers. Ventilate and wash the area after cleanup is complete. It may be necessary to contain and dispose of cyclohexanethiol as a hazardous waste. Contact the federal and local Environmental Protection Agency (EPA) for specific recommendations.