

# **Hazardous Communication Program (HAZCOM), PPE, Welding Safety, Ergonomics, Combustible Dust, Eyewash/First Aid Stations, Gasoline Safety/Storage, Violent Behavior, General Electrical Safety**

## **Hazardous Communication (HazCom)**

A hazardous communication (HazCom) program is a written document that helps ensure chemical and hazardous material safety in the workplace by providing information about the identities and hazards of the chemicals/materials and making sure they're available and understandable to employees. OSHA's Hazard Communication Standard (HCS) requires the development and distribution of:

- Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import, and prepare labels and safety data sheets to convey the hazard information to their downstream customers;
- All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately. (OSHA, osha.gov)

This training session will help employees better understand how to prepare for and safely work with hazardous chemicals they may be "exposed" to in the workplace. Employees will learn about the hazards and protective measures through written labels and safety data sheets, how to read and understand such information, and determine how to acquire and use the information in their own workplace.

### **Chemicals And You:**

- When handling any chemical, certain questions should be asked:
  - What is this product?
  - How do I handle it?
  - What is at risk if I am exposed?

### **Reminder: Safety Data Sheet (SDS)**

Due to continued transportation of chemicals amongst countries, the United Nation has come up with a system to standardize the classification and labeling of chemicals. This system or standard is known as the Globally Harmonized System of Classification and Labeling of Chemicals or GHS. A part of this system includes a new 16 section standardized format for Safety Data Sheets (SDS's), formally known as Material Safety Data Sheets (MSDS's). It will also include a new 6 section labeling system, to be used as a quick summary of a chemical. (OSHA, osha.gov) Here are some key points to remember:

- OSHA requires the use of Globally Harmonized System (GHS)
- GHS is implemented through HazCom
- It provides a universal approach
- More thorough information is mandated for all chemical products
- All MSDSs should already be replaced by SDSs
- All shipping labels will follow a new 6 section format

### **Workers Right to Know:**

Chemicals are necessary to perform many jobs. However, if they are not handled properly, they can present a hazard to your health and safety. The Hazard Communication Standard (HazCom) has been developed by OSHA to inform employees of workplace chemical hazards. Under the HazCom rule, you have the right to know about the hazards in your workplace and how to protect yourself against them. (OSHA, osha.gov) These rights include:

- Right to understand specific hazards
- Right to information, knowledge, and equipment to prevent safety and health problems
- Right to access safety data sheets (SDSs)
- Right to recognize, understand, and use labels

### The Absolute Musts for Employers:

- Provide a written hazard communication program
- Access to all material safety data sheets (SDSs)
- Provide training on Hazard Communication, which includes:
  - Rules and how materials are used in workplace.
  - How to recognize, understand, and use labels and safety data sheets (SDSs).
  - Safety procedures to follow when working with hazardous materials.

### The Responsibilities of Employees:

- Read and interpret labels and SDSs
- Follow employer instructions and warnings
- Identify hazards before starting a job
- Participate in training

### Forms of Hazardous Chemicals:

- Solids
  - Dust, powder, or fumes
- Liquids
  - Vapors, mists, gasoline, cleaners, or solvents
- Gases
  - Aerosols, propane

### Two Types of Chemical Hazards:

Under the Hazard Communication Standard (HCS), any chemical that presents a physical hazard or a health hazard is considered a hazardous chemical. The HCS defines physical and health hazards as:

- Physical hazard - there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.
- Health hazard - there is statistically significant evidence that acute or chronic health effects may occur in exposed employees.

Basically, physical hazards are hazards that happen to the chemical itself. If present during a physical hazard, you can be at risk or become injured. Health hazards are hazards that impact your personal health. Based on your exposure to the chemical, you could encounter short-term or long-term health effects. (OSHA, osha.gov)

The following are the different types of hazards identified in the HCS:

<u>Physical Hazards</u>	<u>Health Hazards</u>
Explosive	Acute toxicity
Flammable (gasses, aerosols)	Skin Corrosion or irritation
Oxidizer	Serious eye damage or eye irritation
Self-Reactive	Respiratory or skin sensitization
Pyrophoric	Germ cell mutagenicity
Self-Heating	Carcinogenicity
Corrosive to metal	Reproductive toxicity
Gas under pressure	Specific target organ toxicity

## Health Hazards: Effects of Exposure:

Health hazards are hazards that impact your personal health. They can be divided into two categories, short-term and long-term. Short-term (or acute) effects can be noticed quickly and medical assistance should be sought. Long-term (or chronic) can be harder to define. It often takes long periods of time to see the effects of long-term health hazards. It can often take months, years, or decades. (OSHA, osha.gov) For example:

### Short-Term "Acute"

- Results of brief exposure
- A few times over a short period
- Effects generally occur soon after exposure
- Symptoms might include:
  - \* Rash
  - \* Dizziness
  - \* Headache
  - \* Respiratory irritation
  - \* Eye irritation

### Long-Term "Chronic"

- Exposed over a long period of time
- Effects are usually permanent
- Can also occur from brief exposure if exposed to high concentration
- Symptoms might include:
  - \* Chronic illness
  - \* Lung and liver damage
  - \* Cancer

## Health Hazards: Exposure:

- Skin and eye contact
  - Especially with liquids
- Inhalation
  - Fumes, vapors, mists, dust
- Ingestion
  - Eating, drinking, consumption
- Absorption
  - Through skin contact

## Workplace Labeling:

Workplace labels are a group of written, printed, or graphic information relating to a chemical/hazardous material that are written on or attached to the container of the chemical, or to the outside packaging.

Hazard Communication labeling requirements include:

- All containers must be labeled with what contents are inside
- Must be able to read and understand label
- If removed or damaged, must be replaced immediately
- Labels must follow the GHS standard or cooperate with the product's SDS

## Potential Exposure:

- Know where eyewash stations are located
  - Corrosives require a station within 20 feet
  - Some chemicals may require immediate contact of emergency services
- Understand the routes of exposure for the chemical being used
  - Inhalation, ingestion, absorption, injection
- Educate yourself on exposure symptoms
  - May be found in the SDS
  - May require further training to stay safe

## Cleaning Up Chemical Spills:

In the event of a spill of any kind, cleaning up in a timely manor is necessary. However, there is a certain process that must be followed to ensure it is cleaned up properly.

1. Immediately tell others to stay clear
  - Inform management if required
2. Limit access or cordon off the area if needed
3. Refer to SDS on how to safety clean up the product
4. Apply appropriate PPE
5. Clean up entire affected area
6. Dispose of material used to absorb or clean up spilled chemical according the SDS recommendations
7. Inform those around you that the area is open

### **Personal Protective Equipment (PPE)**

Personal protective equipment (PPE) is one of the best defenses against exposure to job related hazards. When you use the appropriate PPE, and use it correctly, you can significantly reduce your risk of injury. Most PPE needs to be American National Standard Institute (ANSI) approved. Your company will provide you with the appropriate personal protective equipment.

#### **Employers Must Protect Employees:**

- Assess the workplace
- Eliminate and reduce the hazards found using engineering and administrative controls
- Use appropriate personal protective equipment
- Personal Protective Equipment is the last level of control

#### **Hierarchy of Controls:**

- Your company should select the controls that are the most feasible, effective, and permanent.
- Elimination (most effective) – Physically remove the hazard. Eliminate or control all hazards (hazards that cause death or physical harm) immediately.
- Substitution – Replace the hazard. Substitute to less hazardous material or reduce energy (e.g., lower speed, force, amperage, pressure, temperature, and noise).
- Engineering Controls – Isolate people from the hazard. Develop controls to prevent exposure to the hazard (e.g., machine guards, ventilation systems, etc.).
- Administrative Controls and Procedures – Change the way people work. Utilize trainings, other employees and shifts, machinery and equipment, and aids to change how the job or task is performed.
- PPE (least effective) – Protect the employee with Personal Protective Equipment (PPE). Utilize PPE to create a barrier between the employee and the hazard.

#### **What PPE are you required to wear?**

- Eye and Face Protection?
- Foot Protection?
- Respiratory Protection?
- Hearing Protection?
- Hand Protection?
- Clothing Protection?

#### **Hazard Assessment:**

OSHA requires employers to conduct a written hazard assessment to determine the type of PPE needed for each job or task within the workplace. This assessment needs to:

- Evaluate every job function
- Determine if hazards are present
- Check for hazards to all parts of the body
- Determine appropriate PPE
  - If hazards cannot be removed

### **Selecting the Right PPE:**

OSHA requires that you use the correct PPE to protect you from injuring your head, eyes, face, respiratory system, hands, and feet. When using PPE, be sure it:

- Fits properly each time you use it
- Provides you with the protection you need
- Is comfortable enough so you can move and perform your job.

### **Eye and Face Protection (ANSI Z87.1):**

- Examples of Hazards
  - Chemical splashes, Blood or OPIM splashes or sprays, Intense light, Dust and other flying particles, Molten metal splashes
- Eye and face protection – must comply with
  - ANSI Z87.1-2003, ANSI Z87.1-1989 (R-1998)

### **Foot Protection (ANSI Z41):**

- Causes of foot injuries:
  - Falling or rolling of heavy objects, Crushing or penetrating materials, Sharp objects that can penetrate the sole, Exposure to molten metal , Working on, or around, hot, wet, or slippery surfaces , Working when electrical hazards are present.
- Examples of Foot Protection
  - Steel-toed boots, slip-resistant soles, chemical resistance, waterproof

### **Respiratory Protection:**

- Examples of Hazards
  - Airborne dusts, vapors/fumes, lack of oxygen
- Examples of Respiratory Protection
  - Filtering face piece (dust mask), air purifying respirator, air supplied, self-contained breathing apparatus (SCBA)

### **Hearing Protection:**

- Examples of Hazards
  - Employees need to be aware when Time Weighted Average is at or above 85dB, and protection is made available.
- Hearing protection is required when TWA is at or above 90dB or one time max at or above 129dB.
  - Annual exams must be conducted at this point
- Examples of Hearing Protection
  - Earplugs, canal caps, and earmuffs

### **Hand Protection:**

- Examples of Hazards
  - Skin absorption of harmful substance, severe cuts or lacerations, severe abrasions, frostbite
- Examples of Hand Protection
  - Chemical-resistant, Kevlar, metal mesh, cut-resistant, leather, extreme temperature, and electrical wor

### **Clothing Protection:**

- Examples of Hazards
  - Hot or cold materials/objects, hazardous materials, welding hazards, moving machinery
- Examples of Clothing Protection
  - Laboratory coats, Coveralls, Vests, Jackets, Aprons, Surgical gowns, Full-body suits

**Care for your PPE:**

In order for your PPE to work properly to protect you, you must keep it in good condition. Here are a few general rules:

- Always check PPE for damage after you use it
- Clean PPE before putting it away
- Disposal of any single-use or damaged PPE only in the proper manner
- Store PPE carefully in its assigned place. Avoid conditions that could damage it, like heat, light, moisture, etc.

**Ergonomics**

Musculoskeletal disorders (MSDs) affect the muscles, nerves, blood vessels, ligaments and tendons. Workers in many different industries and occupations can be exposed to risk factors at work, such as lifting heavy items, bending, reaching overhead, pushing and pulling heavy loads, working in awkward body postures and performing the same or similar tasks repetitively. Exposure to these known risk factors for MSDs increases a worker's risk of injury.

Work-related MSDs can be prevented. Ergonomics (fitting a job to a person) helps lessen muscle fatigue, increases productivity and reduces the number and severity of work-related MSDs. (OSHA, osha.gov)

**Why is it important?**

- Strains and sprains are the leading cause of workplace injuries
- Improper lifting can lead to disabling injuries or lifetime chronic pain
- Injuries can affect well beyond one's job performance but also home life
- Ergonomics-related injuries accounted for over 380,000 days-away-from-work cases in the past year

**Proper Posture:**

Having good posture greatly reduces the amount of stress you can see on your back. Once your back deteriorates getting it back to 100% becomes near impossible.

- Lift with your legs, not your back
- Keep proper posture when sitting, walking, or working
- Bend at hips and knees when squatting
- Take the time to stretch throughout the day
- Make sure to rest and alternate:
  - If you stand most of the day, make sure to sit
  - If you sit most of the day, make sure to stand

**Hand Stretches Fist to Fan:**

1. Begin with both of your hands in front of you and palms facing downwards
2. Make a fist with both hands
3. Open the fist halfway so your finger are bent at the knuckles. Hold for two seconds.
4. Open your hands fully so all five fingers are straight and spread wide apart. Hold for 2 seconds.
5. Re-make a fist and repeat routine again.
6. Repeat for routine for five times

**Hand Stretches Thumb Touches:**

1. Hold your hands outwards with your palms facing the ceiling
2. With your right hand, slowly bring your thumb to touch the tip of every finger
3. Repeat on the other hand
4. Return to the starting position
5. Repeat five times with both hands

#### **Wrist Stretch Shake it Out:**

1. Begin with your hands out in front of you and palms facing the floor
2. Slowly shake your hands by letting your wrist go limp
3. Continue for 10-15 seconds
4. Repeat up to three times

#### **The Basic Stretch:**

1. Hold your right hand out in front of you with the palm facing upwards
2. Grip all four fingers with your opposing hand
3. Gently pull the fingers down towards the floor
4. Hold the stretch for ten seconds, then release the hand back to the starting position
5. Repeat with the left hand, holding for ten seconds
6. Repeat the exercise five times

#### **Combustible Dust**

Any combustible material can burn rapidly when in a finely divided form. If such a dust is suspended in air in the right concentration, under certain conditions, it can become explosible. Even materials that do not burn in larger pieces (such as aluminum or iron), given the proper conditions, can be explosible in dust form.

The force from such an explosion can cause employee deaths, injuries, and destruction of entire buildings. For example, 3 workers were killed in a 2010 titanium dust explosion in West Virginia, and 14 workers were killed in a 2008 sugar dust explosion in Georgia. The U.S. Chemical Safety and Hazard Investigation Board (CSB) identified 281 combustible dust incidents between 1980 and 2005 that led to the deaths of 119 workers, injured 718, and extensively damaged numerous industrial facilities. (OSHA, osha.gov)

#### **What Dusts are Combustible?**

As mentioned above, any combustible material can burn rapidly when in a finely divided form. For example:

- Some metal dusts
- Cosmetics
- Dyes
- Grain and other foods
- Wood dust
- Coal and other carbon dusts
- Plastic dust
- Biosolids
- Organic dust such as sugar, paper, soap, and dried blood
- Certain textile materials

#### **Combustible Dust Fires:**

For a combustible dust explosion, it requires the presence of all these factors:

- Confinement
- Dispersion
- Fuel (dust)
- Oxidant
- Ignition Source

## **Welding Safety**

Welding joins materials together by melting a metal work piece along with a filler metal to form a strong joint. The welding process produces visible smoke that contains harmful metal fume and gas by-products. This section discusses welding operations, necessary requirements, and suggestions for protecting employees from exposures to the many hazardous substances in welding fume. (OSHA, osha.gov)

### **Playing With Fire:**

Let's begin by looking at some statistics about welding operations.

- Average 500,000 workers are injured annually
- 1 in 250 workers will die from a welding related accident in a working lifetime
- Many of these incidences are preventable

### **Common Hazards & Accidents:**

- Shock & electrocution
- Dripping & flying debris
- Damage or loss of vision
- Explosions
- Toxic welding fume

### **Taking Precautions:**

- Gather and apply appropriate PPE
  - Welding helmet/hood, gloves, apron, sleeves, boots
- Remove jewelry and pull back long hair or beards
- Remove clutter or flammable items from work area prior to starting
- Ensure the use of welding curtains to protect other employees
- No matter the type of welder, inspect all components before starting
- Have a fire extinguisher readily available

### **When Ventilation is Needed:**

- Welding in less than 10,000 square feet
- Ceilings lower than 16ft
- In a confined space

### **Take Extra Pre-Caution When Working With:**

- Stainless-Steel
- Lead, Mercury, Zinc
- Cadmium, Beryllium, Fluorine Compounds
- Any Chemical Cleaning Compounds

## **First Aid Kits and Eyewash Stations**

According to OSHA, first aid refers to medical attention that is usually administered immediately after the injury occurs and at the location where it occurred. It often consists of a one-time, short-term treatment and requires little technology or training to administer. First aid can include cleaning minor cuts, scrapes, or scratches; treating a minor burn; applying bandages and dressings; the use of non-prescription medicine; draining blisters; removing debris from the eyes; massage; and drinking fluids to relieve heat stress.

### **First Aid Kits:**

- Shall be maintained
- Need to readily available
- Need to be inspected frequently
  - At least once per year

- Ensure expended items are replaced

Industry Specific:

- OSHA does not state the specifics of what has to be included
- OSHA defers to ANSI for guidelines (American National Standard Institute)
  - Class A is recommended for office spaces, warehouses, and light assembly
  - Class B is recommended for manufacturing, welding, woodworking, fabrication, or printing

**Eyewash Stations:**

- Must be located within 10 seconds
- Located in a well-lit area and identified with a sign
- Located on same level as the hazard
- Path of travel must be free of obstructions
- Deliver 0.4 GPM tepid flushing fluid for 15 minutes
- Must be able to flush both eyes simultaneously
- ANSI suggests weekly inspections/activation
  - At minimum, SMS suggests monthly
  - Needs to be cleaned regular

**Bottles:**

- Good for immediate use and close proximity
- Can be used as traveling to flushing station
- Must be replaced when expired
- Kept in clean usable condition
- Should be accommodated with a plumbed station
  - Sink adaptors can be used
- SMS suggests monthly inspections to ensure
  - Bottles are not expired or opened
  - Bottles are being kept clean
  - Allows for documentation

**Required:**

**Eyewashes are required when:**

- Exposed to corrosive materials
- Doing activities including:
  - Open tank surface
  - Storage and handling of ammonia
  - Powered industrial trucks
  - Pulp
  - Paper and Paperboard manufacturing
  - Telecommunications
  - Handling formaldehyde
  - Hazardous Materials

**Gasoline Safety and Storage**

Safe gasoline storage can be one of the biggest fire preventions that anyone can do in and out of the facility. Between 2011 and 2015, municipal fire departments in the U.S. responded to an estimated average of 37,910 fires at industrial or manufacturing properties each year, with annual losses from these fires estimated at 16 civilian deaths, 273 civilian injures, and \$1.2 billion in direct property damage.

**How to Safely Store Your Gas:**

DOT containers are one of the main ways to fully store liquid gasoline. This is because it has gone through various levels of safety checks to prove it will hold in the liquid and fumes with no leakage.

- Use DOT-approved gas cans for safe fuel transport and storage
  - flash-arresting screen
  - spring-closing lid
  - spout cover
- Different types of DOT gas cans:
  - Type I **Safety Cans**- have only one opening.
  - Type II **Safety Cans**- have two openings
- No larger than 5-gallon containers kept
  - Plastic containers are less likely to reach DOT standards

**Tips for Gas Safety:**

- Store gasoline in a fire-proof storage cabinet when possible (even smaller amounts)
- Only use approved containers with a tight-fit locking cap or spring closing lid
- Keep fuel away from fire, heat sources, and spark-generating machines
- If you spill gasoline, clean it up immediately
- Stage fire extinguishers nearby to containers in case of a fire
- Always secure safety cans during vehicle transportation
- Do not fill containers inside vehicles
- Keep the nozzle in contact with the can during filling
- Do not overfill fuel cans
- Shut off your equipment motor and allow time for it to cool off before refueling

**Violent Behavior**

Violent Behavior a lot of time can be seen coming prior to the event from taking place. We want to see some of the warning signs that come from these, and work on preventing them before they start. For those situations that may start to ramp up we have some easy skills that help diffuse some basic situations.

**Violent Behavior Warning Signs:**

- Body language
- Behavioral changes
- Cliques developing
- Strange comments are made
- People taking sides
- A lack of tolerance
- Large number of complaints starts to rise

**Steps to Diffusing Conflict:**

- Situational awareness
- Take care with your words
- Acknowledge the problem
- Be a great listener
- Be empathetic
- Use silence
  - Allow them to speak about the issues
- Give choices

**Management Resolution Steps:**

- Create an Open Door Policy
- Determine the Severity of the Situation
- Take Action When Necessary
- Listen to All Parties Involved
- Document the Incident
- Get Insight from your Employee Handbook

- Create a Comprehensive Solution

## **Electrical Safety**

Electricity is an essential part of modern life, both at home and at the workplace; however, working with electricity can be dangerous. Some employees, such as engineers, electricians, and power line workers, work with electricity directly. Other employees, such as office staff and machine operators, work with it indirectly. Regardless of whether employees work with electricity directly or indirectly, each type can be exposed to serious electrical hazards. OSHA's electrical standards/requirements are designed to protect employees exposed to the dangers of working with electricity, such as electric shock, electrocution, fires, and explosions.

### **Electrical Panels:**

Electrical panels and disconnects are our access points to control electrical energy. It is important that we always have access to them. Electrical panel and disconnect requirements include:

- Ensure there is clearance to electrical panels and disconnects
  - Mandatory clearance of 3 feet (36 X 30 inches)
  - Must have a clear path to access (28" path)
- We need to replace missing blanks or knockouts
- Electrical panels need to be labeled with voltage

### **Electrical Cords:**

Electrical cords are used in almost every part of our lives. It is important that they are in good condition prior to each use. Electrical cord requirements include:

- Can become a trip hazard
- Extension cords are to be used for temporary wiring only
  - Permissible up to 90 days
- Must have grounding pin or be polarized
  - Polarized has one blade wider than the other
- Damaged cord should not be used
  - Cut, crushed, exposed wires, etc.
- Only the plug of an extension cord can be repaired
  - The cord cannot be repaired

### **Daisy Chains & Multi-plugs:**

When we are in need of more electrical outlets, we often resort to extension cord and power strips. When doing so, there are a few things we need to keep in mind. For example:

- Extension cords and multiplugs should not be plugged into each other
  - Power strip into power strip
  - Extension cord into extension cord
  - Power strip or extension combined together
- You will need the proper equipment for the job
- Can lead to overloading, failure, and/or fire
- Only power strips with equipped internal fuses are acceptable as permanent wiring

### **Resources**

- (OSHA, [osha.gov](http://osha.gov))