

INTRODUCTION
TO
SAFETY
AND
HEALTH

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INTRODUCTION TO SAFETY & HEALTH

Every work assignment exposes workers to conditions and situations that are actual or potential dangers to themselves and their co-workers. The use of toxic and flammable materials, pressure equipment, ladders, scaffolding and hand tools involve hazards. Hazards can be part of the work environment, such as open sided platforms, and hazards such as falling objects can also be caused by workers. Ninety percent (90%) of all fatalities in construction are a result of falls from elevation, struck-by, caught-in-betweens and electrical shock. The varying nature of painting and decorating job sites can make recognizing hazards difficult due to changes in situation and materials. *It is essential that workers be informed about hazards and trained to recognize harm.*

This section is only an introduction to job hazards and controls in the industry. There is no substitute for proper training and safe work practices. Daily responsibility for a safe and healthy workplace is shared by employers and employees. Contractors' compliance, health and safety regulations, a well planned safety and health program, and your familiarity with the rules and practice of safe procedures are the best guarantees against accident and illness. Carelessness and "short cuts" produce unsafe conditions that may cause accidents resulting in lost time and materials, and above all else, human injury. Remember that hazards exist in every job. The relaxing of precautions on one job can become a habit that is carried over to the next job. It is important to start good work habits now so that you will take precautions, work safely and remain healthy throughout your career and into retirement.

WHAT IS OSHA?

The Occupational Safety and Health Administration (OSHA) is concerned with the protection of worker safety and health on the job in the United States. OSHA is located with the United States Department of Labor and was created to develop regulations and enforce the OSHA Act. OSHA is based in Washington, DC but has regional and area offices nationwide. The local area offices inspect workplaces, issue citations and collect fines for violations of the OSHA standards (regulations).

There are many standards for safe scaffolds, ladders, respirators, fire protection, chemical storage, use, exposure, and training. Standards set by OSHA are published in Section 29 of the Federal Register Code of Federal Regulations (CFR), with parts 1915 reserved for maritime industries, parts 1910 for general industry and parts 1926 for the construction industry.

The law requires that all employers obey OSHA regulations and the health and safety standards. OSHA regulations apply to all employers regardless of size. The only exception is that small employers (less than 10 employees) are exempted from some injury recordkeeping requirements (29CFR 1904.15).

In addition to setting standards such as HAZCOM and Respiratory Protection, OSHA is charged with:

- Inspecting work places to ensure standards are being met.
- Issuing citations and fines to companies that do not meet the standards.
- Overseeing state plans for safety and health.
- Encouraging the development of training programs for workers, management, and health professionals.

OSHA Act

The Occupational Safety and Health Administration Act as passed by the United States Congress in 1970 is enforced by the Occupational Safety and Health Administration (OSHA). The purpose of the Act is to ensure that every worker in the United States has a safe and healthy place to work.

The Occupational Safety and Health Administration set standards to cover exposure to hazardous chemicals and unsafe conditions. The OSHA Act defines workers rights and places important responsibilities on the employer. For example, employers must develop safety and health programs that have procedures and work practices to protect employees from hazards. All workers have the right to a safe and healthy work place and to know of health hazard exposures.

OSHA's Hazard Communication Standard

There is a special right to know standards called the Hazards Communication Standards (HazCom). Because of the seriousness of handling toxic materials OSHA passed the HazCom standard for the construction industry in 1989. OSHA frequently cites companies for violation of this standard.

In Canada, parallel legislation is "Workplace Hazard Material Information System" (WHMIS). In the following section HazCom generally refers to WHMIS.

This standards says that chemical manufacturers, importers and distributors must evaluate the chemicals they produce or distribute to see if they are harmful or dangerous. This information must be passed on to all users. *Contractors and painters have the right to know about the chemicals with which they work.* All workers are covered by the Hazard Communication Standard.

The Hazard Communication Standards consists of four primary sections:

- ◆ Written Hazard Communication Program
- ◆ Labels
- ◆ Material Safety Data Sheets (MSDS)
- ◆ Employee Information and Training

Written Hazard Communication Program

Your contractor must develop a written plan describing how the company will comply with the HazCom standard and how the information will be passed on to you. The plan should have sections covering *container labeling, Material Safety Data Sheets, employee training and a list of hazardous chemicals* in each work area. The written program needs to be made readily available to employees, designated representatives and OSHA upon request. This information will enable you to make intelligent decisions about how to handle and store the products you use.

Labels

All chemical containers must be labeled with clear, easy to read labels. A container is a bottle, bag, can, cylinder, vessel, vat, storage, tank, carton, or drum. The *label* must include: *identity* of hazardous substance, *hazard warnings*, and the name and address of the *manufacturer*. If bulk materials are put into smaller containers, labels must be put on the new containers. Never put chemicals into unmarked containers. Never assume you know what is in a container.

Material Safety Data Sheet (MSDS)

A Material Safety Data Sheet (MSDS) has product information supplied by the chemical manufacturer or distributor of a chemical product. Your contractor must collect MSDSs for every product that is used on the job and make them available to you. You should review the MSDS before you use a product or whenever you need to know how to handle a product safely.

The following list is the type of information you will find on an MSDS:

- The name of the product and name, address and telephone number of the manufacturer.
- The names of the chemicals in the product.
- Any cancer causing chemicals that may be present.
- The physical properties of the product; is it heavier than air?, does it mix with water?

- Is it flammable, combustible or reactive?
- Routes of entry into your body.
- Signs and symptoms of exposure.
- Short and long term health effects.
- Emergency first aid procedures to use.
- Safe storage and safe work practices to use.
- OSHA permissible exposure limit. (PEL)

Education and Training

Under the HazCom standard, employers must provide training for all employees who are exposed to hazardous substances. Education must include the requirements of the OSHA HazCom standard and how to read labels and MSDSs. Employees must be informed where the employer's written program, MSDSs, and hazardous chemical list are located and employees must be made aware of specific chemical hazards in the work area.

CHEMICALS AND THEIR HEALTH EFFECTS

Many paint materials that are used on the job are *hazardous to your health*. Pigments, solvents, and some binders are examples of materials that are considered toxic. Usually we say a substance is toxic or poisonous if it causes injury to the body. Poisons can be breathed in, eaten, injected or absorbed through the skin. These are called the routes of entry.

Routes of Entry

How chemicals get into your body varies according to their form. Gases, mists and vapors are easily breathed in. Liquids can enter by being breathed in or by passing through your skin, eyes, or mouth. Solids, in the form of dusts, fibers, smoke and fumes can be breathed or taken in through the mouth from handling food, cigarettes or cosmetics with contaminated hands. Due to routes of entry, personal hygiene is extremely important.

Acute Effects

The type and severity of the health effects a substance may cause depends on many factors like: the toxic nature of the substance, how long exposure lasts, how much of the substance gets into your body, how and where the chemical enters your body and your individual state of health. Some of these materials can cause acute (short term) symptoms soon after exposure, such as irritation to the breathing passages, headaches and dizziness. Many times these effects are reversible after exposure stops.

Chronic Effects

Some materials can also cause chronic (long term) illnesses such as brain damage, cancers, nerve damage and liver or kidney disease. They result from repeated exposures over a long period of time and may take weeks, months or even years to appear. Many times chronic effects can not be reversed even if exposure stops. The best way to protect your health is to prevent exposures on the job.

HAZARD CONTROLS

Substitution

An important control method to prevent exposures on the job is to substitute safer products for the harmful products you are presently using. For instance, at one time painters used benzene as their main solvent until scientists discovered that it caused leukemia, cancer of the blood. Now painters have substituted safer solvents such as mineral spirits for benzene and have prevented a lot of illnesses that might have occurred from the continued use of benzene. To select safer products and to understand what chemicals you are using you should review the Material Safety Data Sheet (MSDS) and read the labels.

Engineering Controls

There are other control methods to protect yourself from toxic substances. Substituting more harmful substances with less toxic or nontoxic ones, as already discussed, is the most effective method for reducing exposure. After substitution, engineering controls, such as ventilation and covered containers, are the second best method for reducing exposures. Engineering controls help keep substances out of the worker's breathing zone. Perhaps the most widely used and important form of engineering control in the paint and allied trades is ventilation. The type of system needed depends on the type and amount of air contaminants and the work site layout. Training is needed to properly ventilate an area.

Administrative Procedures

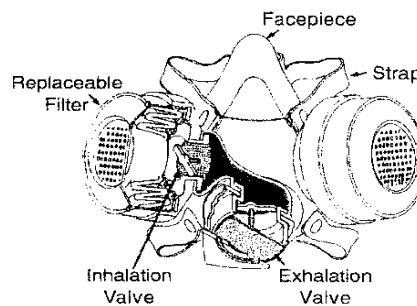
When substitution and engineering controls either separately or together cannot reduce exposure to hazardous substances to safe levels, then administrative procedures are used to control hazards. Administrative procedures arrange work schedules to reduce each worker's daily duration of exposure to hazardous substances. Job rotation and rest periods are examples of administrative controls.

Personal Protective Equipment (PPE)

If substitution, engineering controls and administrative procedures are not feasible, then use personal protective equipment (PPE). It is your last resort. Personal protective equipment should only be used when all other controls have been tried. Properly selected respirators, gloves and goggles are types of personal protective equipment. The personal protective equipment you use must be tested and approved by the National Institute for Occupational Safety and Health (NIOSH) and American National Standards Institutes (ANSI).

Respirators

Respirators are mechanical devices that are worn to protect your lungs from breathing in harmful substances. There are two ways that a respirator can protect your lungs. It can filter the contaminated air before it enters the mask and your lungs. These are called air purifying respirators. Or respirators can supply fresh clean breathing air from a cylinder or compressor, these are called supplied air respirators. Generally speaking, a



Half-Face Masks

respirator is designed to cover all or part of your whole face. The face-piece must fit properly onto your face and be held in place by at least two straps.

Different types of hazards require different types of respirators. Selecting the appropriate respirator is the responsibility of qualified personnel. A number of factors need to be considered when selecting a respirator: Is the hazard a vapor, dust, acid or fiber? What is the concentration of the substance in the air? Is it immediately dangerous to life and health (IDLH)? Is there enough oxygen? When you know the specific hazard it is important to use the correct respirator, filter, canister or cartridge.

Respirator Cartridges and Filters

There are different types of filters and chemical cartridges that fit onto the respirator for various hazards. The cartridges are always labeled and color coded. The respirator and filters must be specific for that type of job and hazard. For instance, organic vapor cartridges are black and are used for organic solvents and HEPA filters (high efficiency particulate air filter) are magenta and are used for dust, mist, lead and asbestos. You can find out the type of hazard and the proper protection by reading the material safety data sheet and reviewing the label.

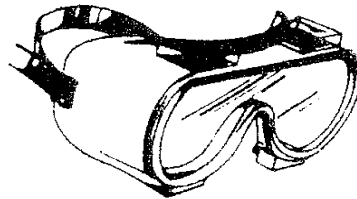
You should not wear any respirator unless you have been properly trained, you have had a medical examination to make sure you are physically able to wear one and have been fit tested to ensure that the respirator fits properly. Contractors must follow OSHA's Respiratory Protection Standard (29 CFR, 1910.134).

Gloves

As with respirators, it is necessary to know the specific chemical you are going to be working with when selecting chemical protective clothing and gloves. Material Safety Data Sheets (MSDS) have recommendations for protective equipment for the specific product. Glove catalogs have chemical resistant charts that can also help you choose the best glove for the operation you are going to perform. *Painters should always try to use gloves. They protect your hands from cuts, scratches, heat, cold, chemical burns, and skin contact with hazardous chemicals.* Gloves can give good protection if they are the right ones. The wrong gloves can fail to protect and actually cause a more serious problem. For instance, a wall paper hanger reported using cotton gloves for protection from wallpaper paste. These gloves soaked up the paste and held it in close contact with his skin resulting in severe dermatitis. The most important quality of liquid-proof gloves is their ability to withstand penetration by a particular liquid or vapor. Natural rubber, for example, is excellent protection against water solutions of acids, alkali, and salts, but they are not well suited for use with oils, grease, and many other organic solvents and chemicals. When using organic solvents viton, neoprene or butyl rubber are recommended. Always check your gloves for leaks. Even a small pinhole leak can expose you to serious dangers.

Eye Protection

Flying particles, chemical splashes, and irritating fumes and dusts endanger your most precious tools — your eyes! Just as the skin is easily irritated by the chemicals of paints, the delicate tissues of the eyes are irritated by solvent vapors and can become permanently damaged by direct contact with paint solvents, thinners and solid paint particles. Depending on the job, eye protection can be anything from simple goggles to welding helmets. Safety glasses with side shields protect against flying particles from sanding, buffing and grinding. Z-89 must be printed on the lenses to be approved safety glasses. Chemical splash goggles should be used for protection against splashes. Splash goggles have vents on the top or sides. Face shields protect your face from chemical splashes but they must be worn with goggles.



Do you wear these?

Eye Emergencies

Solvents and other chemical splashes can cause serious damage, even blindness. Eye wash bottles should be available in your immediate work area. If you get splashed in the eye, use these bottles to get to an eyewash station (or a water fountain or sink) where you can rinse your eye for 30 minutes. When you first set up a job, look for the nearest source of water where you can rinse your eyes for 30 minutes in the event of a splash.

Hard Hats

Hard Hats protect against falling objects, impact, bumping into things, and limited electrical shocks. OSHA regulations require the use of hard hats

whenever there is a danger of head injuries from falling or flying objects. The shell of the hat and the suspension is rated for absorbing impact. The suspension must be adjusted to fit snugly and to keep the shell at least 1-1/4" from your head. The American National Standards Institute (ANSI), marking must be stamped on the helmet with the date of manufacture. ANSI recommends that hard hats must be replaced five years from the date of manufacture.

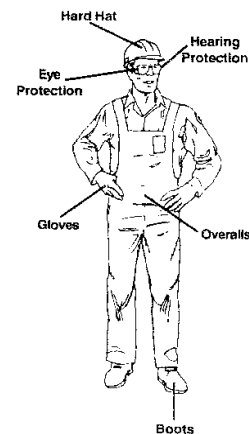
Safety Shoes

Safety shoes protect the feet from puncture and impact. Safety shoes have puncture resistant soles and steel tip toes. Skid proof soles are advisable when working on wet surfaces. When floors are wet with corrosive materials, use special liquid proof boots.

Protective Clothing

When working with potential harmful substances, you may need to use protective clothing to avoid damage to your skin or penetration of the substances through the skin. The article of clothing used - overalls, smocks, pants, hoods, etc. - depends on where contact with the substance is made.

In some cases, like lead removal jobs, in order to avoid carrying home toxic substances, separate lockers for protective clothing and street clothing are necessary. There have been tragic cases of workers' families becoming ill from toxic substances brought home in clothing. You should always wash your work uniform separately from all other clothing.



LEAD PAINT REMOVAL

Lead exposures come from disturbing paint on surfaces previously coated with lead containing paint, such as in bridge repair, residential renovation, and demolition. Lead dust is released into the air whenever lead paint is disturbed. If you are removing lead paint or working lead solder, special precautions are necessary. All workers and their supervisors must receive special training. OSHA issued the Lead Exposure in Construction: Interim Final Rule in May of 1993 (29 CFR 1926.62). For lead abatement work, your worksite should have controls such as HEPA vacuums and you should wear a respirator with a HEPA (magenta) filter cartridge. You should also have a blood testing done before, during and after lead abatement to see if lead has gotten into your system. It is also important to wash up well and change your clothes before going home. Lead you carry home on your clothes can harm children and family members. You should always consider the potential hazard of lead when burning, grinding, sanding or removing paint. If you suspect a surface might contain lead paint tell your supervisor or safety officer.

PHYSICAL AND SAFETY HAZARDS

In addition to the health hazards posed by some materials used, there are also many physical and safety hazards on the work site to consider. Painting conditions can vary from job to job so it is important to be able to recognize possible hazards. Proper training and being constantly aware of your environment are two key factors to avoiding catastrophes.

Confined Spaces

Painters often work in areas that do not have good ventilation, are hard to exit and are not designed for continuous worker occupancy. These areas are confined spaces and can include small rooms or closets, tanks, elevators and sometimes even swimming pools. Confined space work should never be attempted without training in proper procedures for doing so. If you have questions about work areas that may be confined spaces ask your supervisor or the safety officer of your company. Working with flammable materials in enclosed spaces like boilers and tanks can be a serious fire hazard. In a confined space, the concentration of flammable vapors in the air can build up quickly. In well ventilated areas, incoming air dilutes the vapors to prevent a "flammable atmosphere"

Fire and Explosion Hazards

Oil based paints are flammable and the generation of heat or sparks in areas of flammable vapors can cause a fire or an explosion. It takes three things for a fire to burn: fuel (solvents, paints, and flammable vapor), oxygen from the air (almost always present), and a source of ignition (flame, spark, overheated machinery or a lit cigarette). When all three are present in the right proportions fires happen. The contractor is responsible for a fire protection program and must have fire fighting equipment available in case of fires. Standard operating procedures for fire prevention usually include safety rules, equipment checks, training and warning signs. Constant attention must be given to preventing fires and explosions.

Fire Extinguisher

Learn how to inspect and use available fire extinguishers. Fires fall into three classes; A, B, and C. Class A fires involve ordinary combustibles such as wood, cloth and paper. Class B fires are burning liquids such as gasoline, oil, paints, etc. Class C fires involve energized electrical equipment including wiring, fuse boxes, circuit breakers, machinery, and appliances. When working with solvents, make sure available extinguishers are suitable for flammable liquids: Class B, Class BC, or Class ABC. **Never use water (Class A) on electric or flammable liquid fires.**



Know where the fire extinguishers are kept and how to use them on small fires.

Keep flammable materials away from sources of ignition. This is very important on a job site where other trades may be working with power tools and other machinery that could cause sparks. OSHA has a standard that prohibits any sources of ignition within 50 feet of a flammable liquid. The contractor must supply safety cans to dispose of oil rags and other debris. As paint-soaked rags dry, the oil oxidizes causing the temperature to rise and spontaneous combustion can result.

Ladders

Ladders, scaffolding and rigging must be used when the job cannot be accomplished from the floor or ground. The proper set-up and dismantling of this equipment, the safety checks and handling, sometimes require more time than doing the actual job. *Precautions in using these items should never be overlooked for the sake of saving a little time.*

Accidents happen if ladders are damaged or are not used correctly. Improper use of ladders is a major cause of falls at the work site. When selecting a ladder use one of proper length to reach the working height and select a ladder by TYPE or WORKING LOAD to support your combined weight with the materials and tools you are going to use. There are four different types of ladders:

<u>Type</u>	<u>Duty Rating</u>	<u>Working Load</u>
I-A	Industrial-extra heavy duty	300 lbs
I	Industrial-heavy	250 lbs
II	Commercial-medium	225 lbs
III	Household-light	200 lbs

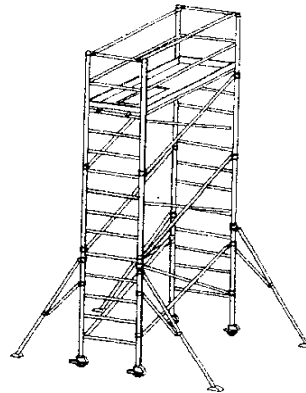
To prevent accidents when using ladders, the following precautions should be taken:

- Check ladders before each use. Make sure that no rungs are cracked, loose, missing or broken. Ladders should never be painted because paint will hide cracks and other serious defects. Never use a painted ladder! Ladders with broken or missing steps or side rails should never be used and should be thrown away or marked for repair.
- Extension ladders should extend 3 feet above the level to be reached.
- Extension ladders should be tied off to prevent slippage.
- Distance from the wall should equal one-fourth of the used length of the ladder. This is commonly known as the 1/4 rule.
- Avoid carrying items in your hands when climbing ladders and always climb facing the ladder.
- Always keep three points of contact with the ladder.
- Never lean out to the side of a ladder past your navel.
- Do not use metal ladders near electrical current or power lines. Metal conducts electricity! You could be electrocuted.

Extra care should be taken when on a ladder and using solvents. Make sure there is adequate ventilation. If you become dizzy while painting on a ladder, wrap your arms around the rungs, rest your head against the ladder, call for help and wait for the sensation to pass.

Scaffolds

Many fatal falls occur as a result of defective scaffold equipment, improper installation and improper training. OSHA requires a "competent person" to supervise all scaffold erections and dismantlings. OSHA defines a "competent person" as someone who can recognize hazards and has the authority to correct them. A fall from as little as four feet high can be fatal. It is important to use caution and common sense when erecting and using all types of scaffolds.



You must have special training and experience to safely erect and use the following types of scaffolding: steel, rolling towers, outrigger, wood, swing stage, and Bosun's or Boatswain's Chair. Tradespeople may be required to use all types of scaffolds in their careers.

Scaffold setup should be planned in advance. All equipment should be inspected by a competent person before it is used. Once it is erected scaffolding should be inspected daily. Some important checks for scaffold safety are:

- Are platforms fully planked?
- Do planks overhang 6-12 inches?
- Are the welds cracked or broken?
- Are all the parts straight?
- Is the scaffold strong enough to hold the required load?
- Is the wood split, cracked or damaged?
- Are the braces and locks in place?
- Is the scaffold properly secured to the structure?
- Are access ladders in place?
- Are the sides fully guarded?
- Did a competent person supervise the erection of the scaffold?

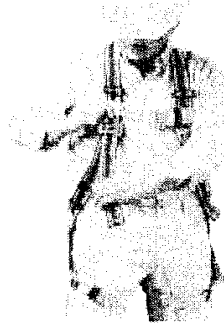
Again, special training is needed to erect, dismantle and properly use a scaffold. OSHA has strict scaffold requirements. They are in the construction standard 29 CFR, 1926.450. *Unless you have been properly trained you legally cannot perform this work.*

Fall Protection

There are many circumstances in which employees must use some type of fall protection. Fall protection needs and methods vary due to job site needs. Basic types of fall protection are: body harness, lanyard, life line, guardrails and safety nets.

Guardrails consist of a toprail, a midrail, and toe board to prevent tools and materials from falling off the edge. Guardrails can be made of wooden 2x4's, cables, or pipes.

A personal fall arrest system must be used whenever there are no guardrails. The lifeline must be attached to a secure anchor! The lifeline should be attached to the back of the harness and the whole system should be inspected before each use. Use double lock clips. If harnesses and lifelines or guardrails are not practical, safety nets must be installed. OSHA has special rules to cover the use and installation of these nets.



Full Body Harness

Other hazards that are not necessarily part of the work process, such as slippery floors or items lying around on the floor can cause falls and other injuries. Uninsulated steam pipes can cause burns and rapid evaporation of paint solvents which creates a toxic vapor. Electricity is often a problem when electrical work has not been completed and wiring is exposed or when electric power tools such as grinders and sanders are used. Painters need to know about electrical hazards to prevent electric shock because even a small shock can send a painter off a ladder and cause severe injury.

Electrical Hazards

Electrical current flows through metal, water and the human body. The best way to prevent electric shock is to stay out of the path of the current and not become part of the electrical circuit.

Portable power tools should be grounded so that stray electric current flows back to the earth and not through a worker. All electrical connections should have three pronged plugs and low resistance ground wires. *Never disconnect the ground wire on a three pronged plug.* Ground wires provide an easier path for electricity to flow to the earth and away from you. Remember, current follows the path of least resistance and always tries to run to the ground - so don't get in its way.

Ground fault circuit interrupters (GFCIs) must be used on all portable electrical equipment. This small piece of equipment detects small changes in the current

and breaks the circuit within 1/40 of a second, saving exposed workers from electrocution and injuries. Ground fault circuit interrupters can be built directly inside a power tool or placed on the particular outlet you are using.

Wood and fiberglass (never metal) ladders should be used near exposed and unfinished electrical wiring. Electricity is always dangerous, but when you climb a metal ladder you increase your risk of becoming part of the electrical circuit and increase your risk of injury from electrocution and falls.

SUMMARY

Accidents are caused by unsafe equipment and conditions, poor job planning and unsafe acts. If you do not know the proper procedures for the use of any piece of equipment or machinery do not attempt the job. Even if equipment operation seems easy, if you are not sure ask your foreman or supervisor. Hard and fast rules alone will not insure safe conditions on the job. *Safety and Health can be attained only through constant effort, attention and cooperation on the part of the management, supervision, and employees.*

Many health and accident hazards can be eliminated by using a common sense approach and following the established safety procedures. Development of a proper attitude toward safety is considered by many to be as equal in importance to the development of skills. Accident prevention is largely a matter of attitudes, desire, education and cooperation on the part of everyone.