

Personal Protective Equipment (PPE)

What is Personal Protective Equipment?

Personal protective equipment is any device worn by a worker to protect against hazards.

Some examples are respirators, gloves, ear plugs, hard hats, safety goggles, and safety shoes or boots.

Personal protective equipment (PPE) is designed to protect against safety and/or health hazards. Hard hats, safety glasses, and safety boots, for instance, are designed to prevent or reduce the severity of injury if an accident occurs. Other PPE, such as hearing and respiratory protection, is designed to prevent illnesses and unwanted health effects.

It is important to remember that PPE only provides protection. It reduces the risk but does not eliminate the hazard.



What the Law Says

- Section 25(1) under the Occupational Health and Safety Act (**OHSA**) requires employers to provide equipment, materials and protective devices.
- Make sure they are used as prescribed
- Maintain them in good condition

The **OHSA** also requires workers to use or wear the equipment, protective devices or clothing that has been prescribed.

Occupational Health and Safety Act

Sections 25 and 27 of the OHSA makes employers and supervisors responsible for ensuring that required PPE is worn by the worker.

The employer must also provide the PPE and maintain it in good condition.

Under section 28 of the Act, workers have a duty to wear or use the PPE required by law as well as any required by the employer.

This addresses situations where the regulations may not require PPE but the employer has set additional health and safety standards, such as mandatory eye protection.

Workers also have to report any missing or defective PPE to the employer or supervisor and are prohibited from removing PPE or making it ineffective.

CSA Standards

PPE must be kept in good working order and replaced if it is damaged or has expired.

It must also meet the various Canadian standards, such as the following:

CSA Standard Z94.4-02 – Selection, Care and Use of Respirators

CSA Standard Z94.3-07 – Eye and Face Protectors

CSA Standard Z94.1 – Protective Headwear

CSA Standard Z195-09 – Protective Footwear

CSA Standard Z94.2.02 – Hearing Protection Devices (Performance Selection, Care and Use)

<https://youtu.be/s2z1uM1fXN8>



How Personal Protective Equipment Affects Your Business

The best way to manage hazards in the workplace is to find ways to eliminate them.

Sometimes, however, the use of personal protective equipment becomes the only option to prevent injury or illness and to protect workers from those hazards.

Those injuries and illness can affect your employee morale, your production and quality, and also your company's bottom line.

- An average WSIB claim is \$11,771.
- Factor in other costs like lost productivity and staff replacement, and the cost can be as much as four times more - approximately \$59,000 per injury.
- With a profit margin of 5%, sales/services required to cover the total cost of one injury equals about \$1.2 million

(Source: WSIB "Preventing Slips, Trips and Falls in the Workplace")



Using PPE

The use of PPE is only one element in a complete safety program in helping to maintain a safe and healthy occupational environment.

The implementation of a PPE program should address the hazards present; the selection, maintenance, and use of equipment; the training of employees; and monitoring of the program to ensure its ongoing effectiveness.

Worker protection, compliance with applicable laws and regulations, and technical feasibility are the three considerations in the development of any safety program.

Employers should take the fit and comfort of PPE into consideration when selecting appropriate items for their workplace. Equipment that fits well and is comfortable to wear will encourage employee use.

If several different types of PPE are worn together, make sure they are compatible. If equipment does not fit properly, it may not provide the level of protection desired and may discourage employee use.

Also, ensure all PPE is maintained in a clean and consistent manner. The cooperative efforts of both employers and employees will need to be established and maintained to ensure a safe work environment.

Before you use PPE, you must:

1. Know how to use PPE correctly
2. Be aware of when PPE is necessary
3. Select appropriate PPE for a variety of circumstances
4. Understand the limitations of PPE in protecting employees from injury
5. Know how to wear, adjust and remove PPE properly; and Maintain PPE properly

Having an effective safety program in place is essential in reducing the amount and severity of work-related injuries and illnesses and their related costs.

In fact, a successful health and safety program provides better worker protection, can save time and money, can increase productivity, and reduce worker injuries, illnesses and related workers' compensation costs.

When You Are Selecting PPE, Consider Three Key Things

- **Type of anticipated exposure.**

This is determined by the type of anticipated exposure, such as touch, splashes or sprays, or large volumes of blood or body fluids that might penetrate the clothing. PPE selection, in particular the combination of PPE.

- **Durability and appropriateness of the PPE for the task.**

This will affect, for example, whether a gown or apron is selected for PPE, or, if a gown is selected, whether it needs to be fluid resistant, fluid proof, or neither.

- **Fit.**

PPE must fit the individual user, and it is up to the employer to ensure that all PPE are available in sizes appropriate for the workforce that must be protected.



Types of Personal Protective Equipment

Respiratory protection

- disposable, cartridge, air line, half or full face.

Eye protection

- spectacles/goggles, shields, visors.

Hearing protection

- earmuffs and plugs.

Hand protection

- gloves and barrier creams



Using the Right Glove for Proper Protection

Gloves

- Purpose – patient care, environmental services, other
- Glove material – vinyl, latex, nitrile, other
- Sterile or nonsterile
- One or two pair
- Single use or reusable

Gloves should fit the user's hands comfortably – they should not be too loose or too tight. They also should not tear or damage easily. Gloves are sometimes worn for several hours and need to stand up to the task.



Do's and Don'ts of Glove Use

- **Work from clean to dirty.**

This is a basic principle of infection control. In this instance it refers to touching clean body sites or surfaces before you touch dirty or heavily contaminated areas.

- **Limit opportunities for “touch contamination” - protect yourself, others and environmental surfaces.**

How many times have you seen someone adjust their glasses, rub their nose or touch their face with gloves that have been in contact with a patient, a known contaminant or heavily soiled or dirty product?

This is one example of “touch contamination” that can potentially expose oneself to infectious agents. Avoid touching environmental surfaces and also avoid touching them with contaminated gloves. Surfaces such as light switches, door and cabinet knobs can become contaminated if touched by soiled gloves and also contaminate clean gloves or freshly washed hands.

- **Change gloves as needed.**

If gloves become torn or heavily soiled, then change the gloves before starting the next task. Discard them in the nearest appropriate receptacle.

Washing gloves does not necessarily make them safe for reuse; it may not be possible to eliminate all microorganisms and washing can make the gloves more prone to tearing or leaking.



Personal Protective Equipment (PPE)

The workplace can create many hazards for your hands, whether from chemicals, cuts or burns. No single glove can provide appropriate protection for every work situation, so it is important to assess the risk for each task and select a glove that provides specialized protection.

The following is a list of gloves and their appropriate application:

GENERAL GLOVE INDUSTRIAL USE:			
DISPOSABLE GLOVES	FABRIC GLOVES	LEATHER GLOVES	CHEMICAL RESISTANCE GLOVES
Disposable gloves, constructed using plastic to protect against mild irritants	Constructed using cotton or fabric material, used to insulate the hands from heat or cold. Used for enhanced grip and handling slippery objects	Leather is a traditional material used to protect against injuries from rough abrasive surfaces. Ideal for use in welding applications.	Manufactured from rubber, neoprene, polyvinyl alcohol or vinyl etc. These gloves protect hands from corrosives, oils, and solvents
			

GLOVES LINER TYPE	
KNITTED	Highly breathable, close fitting with good dexterity
SEAMLESS	Avoids hand irritations due to no seams, increase comfort
SEWN & IMPREGNATED	Available with several types of construction and assembly, mainly cut and sewn. Coating is bound to the fabric for good resistance to abrasion. Sewing and impregnation process allows the manufacturing of thin gloves, for enhanced dexterity
COATED/ DIPPED	Made by dipping a knitted or woven cloth liner into the glove compound - the liner "supports" the compound and adds strength. Compound used enhances the mechanical performance, different compounds are used for different conditions

Cotton and fabric gloves: keep hands clean and protect against abrasions but may not be strong enough to handle work with rough or sharp materials.

Coated fabric gloves: provide protection against some moderate concentrated chemicals. They can be used in laboratory work provided they are strong enough to protect against the specific chemical being handled.

Rubber, plastic or synthetic gloves: used when cleaning or working with oils, solvents and other chemicals.

Leather gloves: used when welding, as the leather can resist sparks and moderate heat. The risk of cuts and abrasions also can be minimized by wearing leather gloves.

Aluminized gloves: recommended for welding, furnace and foundry work, as they provide reflective and insulating protection.

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Kevlar gloves: have a wide variety of industrial applications. They are cut- and abrasion-resistant and provide protection against both heat and cold.

Chemical/liquid-resistant gloves

- **Butyl rubber gloves:** nitric acid, sulfuric acid, hydrochloric acid and peroxide.
- **Natural latex/rubber gloves:** water solutions or acids, alkalis, salts, and ketones.
- **Neoprene gloves:** hydraulic fluids, gasoline, alcohols and organic acids.
- **Nitrile rubber gloves:** chlorinated solvents.

Masks

A combination of PPE types is available to protect all or parts of the face from contact with potentially infectious material. The selection of facial PPE is determined by the isolation precautions required for the task at hand and/or the nature of probable contact.

Masks should fully cover the nose and mouth and prevent fluid penetration.

Masks should fit snugly over the nose and mouth. For this reason, masks that have a flexible nose piece and can be secured to the head with string ties or elastic is preferable.



Using Face Masks Safely

WHO recommends the following steps are taken when using face makes to prevent the spread of viruses:

- ✓ **Before putting on a mask, clean hands with alcohol – based hand sanitizer or soap and water**
- ✓ **Avoid touch the mask while using it, if you do sanitize your hands or wash with soap and water afterwards**
- ✓ **Replace the mask with a new one as soon as it is damp and do not reuse single- use masks**
- ✓ **To remove the mask: remove it from behind and do not touch the front of the mask; discard immediately in a closed bin, and then clean hands with sanitizer or soap and water**

Under normal circumstances, masks are recommended for food workers to keep food safe during preparation. However, during pandemics and outbreaks, masks are essential and should be worn by all food workers who:

- ✓ Come into contact with customers
- ✓ Work closely with others
- ✓ Handle cooked and ready to eat foods

Goggles

Goggles provide barrier protection for the eyes; personal prescription lenses do not provide optimal eye protection and should not be used as a substitute for goggles.

Goggles should fit snugly over and around the eyes or personal prescription lenses.

Goggles with antifog features will help maintain clarity of vision.



Face Shield

When skin protection, in addition to mouth, nose, and eye protection, is needed or desired, a face shield can be used as a substitute to wearing a mask or goggles.

A face shield is a device used to protect wearer's entire face (or part of it) from hazards such as flying objects and road debris, chemical splashes (in industry), or potentially infectious materials.

The face shield should cover the forehead, extend below the chin, and wrap around the side of the face.

Food workers should wear a face mask under in conjunction while wearing a face shield.



Earmuffs (PPE)

Earmuffs (PPE) are objects designed to cover a person's ears for hearing protection.

They consist of a thermoplastic or metal head-band, that fits over the top or back of the head, and a cushion or cup at each end, to cover the external ears.

Acoustic earmuffs, also known as ear defenders, have cups lined with sound-deadening material, like thermal earmuffs and headphones in appearance, which are worn as hearing protection.

These may be carried on a head-band or clipped onto the sides of a hard hat, for use on construction sites.

Some manufacturers combine headphones with ear defenders, allowing the wearer to listen to music, communication or other audio source and also enjoy protection or isolation from ambient noise.

For extra sound attenuation, earplugs can also be used in conjunction with earmuffs.

Ear defenders protect the wearer from extreme noises.

The head-band and outer covering is usually made from a hard thermoplastic or metal.

The protection usually comes from acoustic foam – this absorbs sound waves by increasing air resistance, thus reducing the amplitude of the waves.



Hard Hat

A hard hat is a type of helmet predominantly used in workplace environments such as industrial or construction sites to protect the head from injury due to falling objects, impact with other objects, debris, rain, and electric shock.

Suspension bands inside the helmet spread the helmet's weight and the force of any impact over the top of the head.

A suspension also provides space of approximately 30 mm (1.2 inches) between the helmet's shell and the wearer's head, so that if an object strikes the shell, the impact is less likely to be transmitted directly to the skull.

Some helmet shells have a mid-line reinforcement ridge to improve impact resistance.



Safety Boot/Shoe

A steel-toe boot (also known as a safety boot, steel-capped boot or safety shoe) is a durable boot or shoe that has a protective reinforcement in the toe which protects the foot from falling objects or compression.

Although traditionally made of steel, the reinforcement can also be made of a composite material, a plastic such as thermoplastic polyurethane (TPU) or even aluminum.

Steel-toe boots are important in construction and manufacturing, as well as a variety of other industries.

Occupational safety and health legislation or insurance requirements may require the use of such boots in some settings and may mandate certification of such boots and the display of such certification directly on the boots.

The markings on the boot label will indicate the national or international standards that the boot was intended to meet, and identify the level of protection offered for impact, compression, penetration, and electric shock.

Safety shoes are effective in keeping the feet of industrial workers safe from sharp and heavy objects while working in factories.

Footwear for use in chemical processing or semiconductor manufacturing may also be rated to dissipate static electricity.



CSA Green Triangle

The CSA Green triangle patch indicates sole puncture protection with Grade 1 Protective toe to withstand impacts up to 125 joules. Sole puncture protection is designed to withstand a force of not less than 1200 Newtons (270 pounds).



Non-Slip Shoes

Non-slip, durable, water-resistant and breathable shoes are the best types to wear when working in a kitchen.

These qualities will not only keep your feet comfortable but will also help you to avoid unnecessary accidents that can lead to injury when working in a kitchen.

Slip resistant shoes are shoes that are designed with soles that have rubberized soles as well as great tread patterns.

Non-slip shoes do not have to have thick soles in order to be non-slip, the tread and type of material used are what make the shoes slip resistant and not the thickness of the sole.



Aprons

Plastic disposable aprons can be worn by food workers to help prevent pathogens from contaminating their clothes, and prevent the spreading of them outside of the work environment.

A new apron should be used every shift and replaced whenever a potential contamination has occurred. Food workers must wash their hands thoroughly with soap and water for minimum of 20 seconds before putting on an apron, and after taking it off.



Cloth apron



Disposable apron