

“Info Sheet” for Foot Protection

If you are at risk for foot injury at your workplace, you should wear the appropriate protective footwear.

- If foot protection is required, set up a complete foot safety protection program including selection, fit testing, training, maintenance and inspection.
- Safety footwear is designed to protect feet against a wide variety of injuries. Impact, compression, and puncture are the most common types of foot injury.
- Choose footwear according to the hazard. Refer to CSA Standard Z195 "Protective Footwear".
- Select CSA-certified footwear. Ensure that it has the proper rating for the hazard and the proper sole for the working conditions.
- Use metatarsal protection (top of the foot between the toes and ankle) where there is a potential for injury.

Footwear must be chosen based on the hazards that are present. Assess the workplace and work activities for:

- Materials handled or used by the worker.
- Risk of objects falling onto or striking the feet.
- Any material or equipment that might roll over the feet.
- Any sharp or pointed objects that might cut the top of the feet.
- Objects that may penetrate the bottom or side of the foot.
- Possible exposure to corrosive or irritating substances.
- Possible explosive atmospheres including the risk of static electrical discharges.
- Risk of damage to sensitive electronic components or equipment due to the discharge of static electricity.
- Risk of coming into contact with energized conductors of low to moderate voltage (e.g., 220 volts or less).

Also, evaluate the risk:

- To ankles from uneven walking surfaces or rough terrain; of foot injury due to exposure to extreme hot or cold; of slips and falls on slippery walking surfaces or of exposure to water or other liquids that may penetrate the footwear causing damage to the foot and the footwear and of exposure to rotating or abrasive machinery (e.g., chainsaws or grinders)

What to look for in fit...

- Walk in new footwear to ensure it is comfortable.
- Boots should have ample toe room (toes should be about 12.5 mm from the front)
- Make allowances for extra socks or special arch supports when buying boots.
- Boots should fit snugly around the heel and ankle when laced.
- Lace up boots fully. High-cut boots provide support against ankle injury.

Recommended Care

- Use a protective coating to make footwear water-resistant.

- Inspect footwear regularly for damage.
- Repair or replace worn or defective footwear.
- Electric shock resistance of footwear is greatly reduced by wet conditions and with wear.

What symbols will be on the footwear?

- The following symbols, or markings, will help you determine which footwear is appropriate for the job.

Selection of Safety Footwear		
Marking	Criteria	Use
	Green triangle footwear has sole puncture protection with a Grade 1 protective toe (withstand impact up to 125 joules).	Any industrial or heavy work environment, including construction, where sharp objects are present (such as nails).
	Yellow triangle footwear has sole puncture protection and Grade 2 protective toe (withstand impact up to 90 joules)	Light industrial work environments that need both puncture and toe protection.
	White rectangle with orange Greek letter "omega" footwear has soles that provide electric shock resistance.	Any industrial environment where accidental contact with live electrical conductors can occur. REMEMBER: Electric shock resistance is greatly reduced by wet conditions and with wear. Also know that conductive footwear as listed in CSA Z195-09 relates to an electrical discharge that might ignite volatile, flammable materials that are close to the wearer. Live electrical work should follow recommendations for an electrically conductive clothing ensemble (as specified under CAN/ULC-60895).
	Yellow Rectangle with green letters "SD" and grounding symbol footwear has soles that are static dissipative.	Any industrial environment where a static discharge can be a hazard for workers or equipment.
	Red rectangle with black letter "C" and grounding symbol footwear has soles that are electrically conductive.	For any industrial environment where low-power electrical charges can be a hazard for workers or equipment.
	White label with green fir tree symbol footwear provides protection when using chainsaws.	For forestry workers and others who work with or around hand-held chainsaws and other cutting tools.
	Blue rectangle footwear provides Grade 1 protective toe with no protective sole	For industrial work that does not require puncture protection.
	Grey rectangle footwear provides Grade 2 protective toe with no protective sole	For institutional and non-industrial work that does not require puncture protection.

- Note 1: The ® symbol indicates the preferred position for the identifying logo or mark or the certifying agency.
- Note 2: Labels are on the tongue of the right shoe at ankle height. They may also appear at ankle height on the shoe itself (for electrical protection footwear)
- From: "Z195-09 Protective Footwear" , Canadian Standards Association, 2009.

Other markings

An "internal protection code" is also required. This code will be permanently marked on the outside or inside of at least one shoe/boot.

Protection Code

Position:	1	2	3	4	5
Mark:	1	P	M	E	X

Position:

1. level of toe protection (1 for Grade 1, 2 for Grade 2, 0 if not)
2. presence of puncture-resistant sole (P if present, 0 if not)
3. presence of metatarsal protection (M if present, 0 if not)
4. type of electrical protection (E if shock resistant, S if static dissipative, C if conductive, 0 if no protection)
5. chainsaw protection (X if present, 0 if not)

Reference Material Sources

- <http://www.ccohs.ca/oshanswers/prevention/ppe/footwear.html>
- Z195.1-02 Guideline on Selection, Care and Use of Protective Footwear, Canadian Standards Association, 2002.
- Z195-09 Protective Footwear" , Canadian Standards Association, 2009

“Info Sheet” for Limb and Body Protection

General Information

Due to the nature of the construction workplace and the number of different hazards, it is not possible to cover specialized limb and body protection in detail. These types of hazards are known as “job exposures” (exposure to fire, temperature extremes, body impacts, corrosives, molten metals, cuts from sharp or abrasive materials). PPE in this category would be items such as:

- leg, arm, chin and belly guards,
- specialty hand pads and grips,
- leather aprons and leggings,
- full body suits,
- flame and chemical resistant clothing, and
- various types of plastic boot covers, and overshoes.

For more information on the type of speciality PPE you require, check your local Department of Environment and Labour office. With all PPE, following the manufacturer’s instructions on its use, care and cleaning is critical and will help you get the full service life from your specialty PPE.

Hand PPE (Gloves and Mitts)

PPE for the hands include: finger guards, thimbles and cots, handpads, mitts, gloves, and barrier creams. Choose hand PPE that will protect against chemicals, scrape, abrasions, heat and cold, punctures and electrical shocks.

Types

PPE for the hands come in many forms, each designed to protect against certain hazards. Gloves most commonly used in the construction industry are made from leather, cotton, rubber, synthetic rubbers and other man-made materials, or combinations of materials.

Vinyl coated or leather gloves are good for providing protection while handling wood or metal objects. When you select hand PPE, keep the following in mind: look for anything at the job-site that may be a hazard to the hands. If gloves are to be used, select the proper type for the job to be done. Inspect and maintain hand PPE regularly. If in doubt about the selection or need for glove or hand PPE, consult your safety supplier or Material Safety Data Sheet (MSDS).

Do's:

- ✓ inspect hand PPE for defects before use
- ✓ wash all chemicals and fluids off gloves before removing them
- ✓ ensure that gloves fit properly
- ✓ use the proper hand PPE for the job
- ✓ follow manufacturer’s instructions on the care and use of the hand PPE you are using
- ✓ ensure exposed skin is covered (no gap between the sleeve and the hand PPE).

Do not's:

- × wear gloves when working with moving machinery (gloves can get tangled or caught)
- × wear hand PPE with metal parts near electrical equipment
- × use gloves or hand protection that is worn out or defective

“Info Sheet” for Respiratory Protection

Workers should use respirators for protection from contaminants in the air only if other hazard control methods are not practical or possible under the circumstances. Respirators should not be the first choice for respiratory protection in workplaces. They should only be used:

- when following the "hierarchy of control" is not possible (elimination, substitution, engineering or administrative controls)
- while engineering controls are being installed or repaired
- when emergencies or other temporary situations arise (e.g., maintenance operations)

Other control methods include:

- mechanical ventilation
- enclosure or isolation of the process or work equipment
- proper control and use of process equipment, and
- process modifications including substitution of less hazardous materials where possible.

Employers should have a written respirator program that describes the proper procedures for selecting and operating respiratory protective equipment. The correct use of a respirator is just as important as selecting the proper respirator. Parts of the respirator program deal with finding out what hazards are present and how much protection that the workers will need. Other parts should describe how to wear and look after the respirator.

Without a complete respiratory protection program, people will probably not receive the best protection from a respirator even if it is the correct choice for a specific job. A respiratory protection program includes several components such as:

- hazard identification and control
- exposure assessment
- respirator selection
- respirator fit-testing
- training program
- inspection and record keeping
- cleaning and sanitizing respirators
- repairing and maintaining respirators
- proper storage of respirators
- health surveillance
- standard operating procedures (available in written form)
- program evaluation

Workers with beards, long sideburns, or even a two-day stubble may not wear respirators because the hair breaks the seal between the skin and the respirator mask. Wearing eyeglasses would also break the respirator seal. This break means that the respirator mask will "leak" and will not provide the needed respiratory protection. Also, if a worker has facial scars or an acne problem, the facial skin may not be able to form a good seal with a respirator mask.

Types of Respirators

The two main types are air-purifying respirators (APRs) and supplied-air respirators (SARs).

Air-purifying respirators can remove contaminants in the air that you breathe by filtering out particulates (e.g., dusts, metal fumes, mists, etc.). Other APRs purify air by adsorbing gases or vapors on a sorbent (adsorbing material) in a cartridge or canister. They are tight-fitting and are available in several forms:

- mouth bit respirator (fits in the mouth and comes with a nose clip to hold nostrils closed - for escape purposes only)
- quarter-mask (covering the nose and mouth),
- half-face mask (covering the face from the nose to below the chin), or
- full facepiece (covering the face from above the eyes to below the chin)

Respirators with a full facepiece also protect the eyes from exposure to irritating chemicals.

Supplied-air respirators (SARs) supply clean air from a compressed air tank or through an air line. This air is not from the work room area. The air supplied in tanks or from compressors must meet certain standards for purity and moisture content (e.g., CSA Standard Z180.1-00 (R2010): Compressed Breathing Air and Systems).

Supplied-air respirators may have either tight-fitting or loose-fitting respiratory inlets. Respirators with tight-fitting respiratory inlets have half or full facepieces. Types with loose-fitting respiratory inlets can be hoods or helmets that cover the head and neck, or loose-fitting facepieces with rubber or fabric side shields. These are supplied with air through airlines.

Examples of these classes of respirators include:

Air-purifying respirators (APRs):

- particulate respirators (previously called dust, fume, and mist respirators or masks),
- chemical cartridge respirators that can have a combination of chemical cartridges, along with a dust prefilter: this combination provides protection against different kinds of contaminants in the air
- gas masks (contain more adsorbent than cartridge-type respirators and can provide a higher level of protection than chemical cartridge respirators)
- powered air-purifying respirators

Supplied-air respirators (SARs):

- self-contained breathing apparatus (SCBA),
- airline supplied-air respirators,
- protective suits that totally encapsulate the wearer's body and incorporate a life-support system

There are some combinations of airline respirators and SCBAs that allow workers to work for extended periods in oxygen-deficient areas or where there are airborne toxic contaminants.

The auxiliary or backup SCBA source allows the worker to escape with an emergency source of air if the airline source fails.

There are also combination air-purifying and atmosphere supplying respirators. These will offer worker protection if the supplied-air system fails, if the appropriate air-purifier units are selected.

These cannot be used in oxygen-deficient areas or where the air concentration of a contaminant exceeds the IDLH level (i.e., immediately dangerous to life or health).

Since filters capture particles, caution must be exercised to always check that these filters are not clogged as it makes it harder for air to pass through and increase the likelihood of contaminated air entering the mask. Cartridges can also become "full" or saturated. It will stop working and "breakthrough" will occur – this term means that the gases or vapors will leak through the cartridge.

Both cartridges and filters must be replaced on a regular basis by using the manufacturer's recommendations (usually determined by using warning properties or end-of-service indicators).

There are 9 classes of particulate filters, depending on the particulate material. They are also classified based on levels of oil resistance and filter efficiency. Oil can break down certain types of filters which means it is important to know the materials you are working with at all times and always select the right cartridge for your respirator.

The main categories are:

- N series (Not resistant to oil) - May be used in any atmosphere where there is no oil particulate.
- R series (Resistant to oil) - May be used in any atmosphere where there is no oil particulate, or up to one shift where there is oil particulate present. "One shift" means eight hours of continuous or intermittent use.
- P series (Oil-Proof) - May be used in any atmosphere, including those with oil particulates, for more than one shift. If the filter is used in atmospheres with oil particulates, contact the manufacturer to find out the service life of the filter.

Equally important is the selection of the correct type of cartridge or filter.

Filters are made of material that is designed to trap particles as you breathe. Cartridges contain a material that absorbs gases and vapors. It is very important to make sure you are using the right filter or cartridge for the chemicals or substances present in the workplace.

Selecting the Right Respirator

Choosing a respirator is a complicated matter. Experienced safety professionals or occupational hygienists, who are familiar with the actual workplace environment, are the staff who should select the proper respirator. They can choose a suitable respirator only after they have

evaluated all relevant factors. This includes considering the limitations of each class of respirator.

Before the proper respirator can be selected for a job, be sure you have already:

- identified the respiratory hazard
- evaluated the hazard
- considered whether engineering controls are feasible

There are too many types of situations to cover them all fully here. However, the following questions represent part of "decision logic" that a safety professional or occupational hygienist can use when selecting a respirator:

- Is it to be used in firefighting or emergencies?
- Is it to be used in oxygen-deficient atmospheres (less than 18% oxygen in air; some jurisdictions say below 19.5%)?
- What is the nature of the hazard (chemical properties, concentration in the air, warning properties)?
- Is there more than one contaminant (i.e. a mixture or more than one chemical is present)?
- Is the airborne contaminant a gas, vapor or particulate (mist, dust or fume)?
- Are the airborne levels below or above the exposure limit, or are they above levels that could be immediately dangerous to life or health?
- What are the health effects of the airborne contaminant (carcinogenic, potentially lethal, irritating to eyes, absorbed through the skin)?
- What are the characteristics of the operation or the process (e.g., hot temperature, confined space)?
- What activities will the worker be doing while wearing the respirator (e.g., strenuous work)?
- How long will the worker need to wear the respirator?
- Does the selected respirator fit the worker properly?
- Where is the nearest safe area that has respirable air?

Use the MSDS/SDS for guidance on requirements of the particular respiratory hazard. The CSA Standard Selection, Use and Care of Respirators Z94.4-11 outlines a respirator selection decision logic model in more detail.

How to care for your respirator; and samples of what you might include on a care checklist.

Checklist for care of respirators

- Inspect the respirator before and after each use and during cleaning.
- Inspect equipment designated for "emergency use" at least monthly, and after each use.
- Replace all parts that are cracked, torn, broken, missing or worn.
- Follow the manufacturer's instructions and consult CSA Standard Z94.4-11 Selection, Care and Use of Respirators for information on the care, maintenance, and storage of respirators.

Facepiece

- Ensure that no holes or tears are present.
- Inspect for cracked, scratched or loose-fitting lenses. For a full facepiece respirator, check for missing mounting clips.
- Ensure that the metal nose clip forms easily over the bridge of the nose on disposable respirators.
- Make sure the facepiece edges are not rippled or distorted.

Head strap/harness

- Check webbing for breaks.
- Look for deterioration of elasticity or fraying edges.
- Test excessively worn head harness.

Inhalation and exhalation valves

- Ensure the valve and valve seat are free of dust particles or dirt that may cause a poor seal or reduce efficiency.
- Replace any missing or defective valve covers.

Filter elements

- Ensure that the filter and mask are certified for use together.
- Check the filter to see that they are approved for the hazard.
- Inspect both the filter threads and facepiece threads for wear, make sure they are screwed together properly, and there is no cross threading.
- Check the filter housing for cracks or dents.
- Check the end of service life indicator for gas masks. Check the expiration date.

Air supply system

- Inspect the air-supply hose and end-fitting attachments for breaks, cracks, or kinks.
- Test the tightness of connections.
- Ensure the proper operation and condition of all regulators, valves or other airflow device
- Monitor the operation of air-purifying elements and carbon monoxide or high-temperature alarms.
- Check seams in suit or blouse for rips and tears.
- Ensure that protective screens are intact and fit correctly over facepiece (abrasive blasting hoods and blouses).

Respiratory battery pack

- Follow the manufacturer's instructions for charging/discharging.
- Before recharging nickel-cadmium (NiCad) batteries, fully discharge them with a discharger designed for those batteries. If this is not done regularly, the NiCad batteries may not provide power for as long as the specifications state.
- Ensure that the batteries are fully charged before using them.

Repair, cleaning and storage

- Do not clean with solvents.
- Follow the manufacturer's instructions.

- Wash with a mild dish detergent or a combination of detergent and disinfectant. Use a brush and warm water (49-60°C or 120-140°F).
- Rinse with clean water, or rinse once with a disinfectant and once with clean water. The clean water rinse removes excess detergent or disinfectant that can cause skin irritation or dermatitis.
- Dry on a rack or clean surface or hang from a clothes line. Position the respirator so that the facepiece rubber will not "set" crookedly as it dries.
- Store the respirator at the end of each shift to protect it from dust, sunlight, heat, extreme cold, excessive moisture, and chemicals.
- Clean and disinfect respirators after each use, where appropriate.
- Permit only trained and qualified personnel to repair respirators.
- Do not mix parts from different manufacturers.
- Record all repairs and inspections.
- Remove dirt.
- Check for distortion caused by improper storage

What is an example of a checklist for caring for my self-contained breathing apparatus (SCBA)?

Checklist for self-contained breathing apparatus (SCBA)

- Inspect the SCBA unit before each use. Test and clean after each use.
- Inspect the equipment designated for "emergency use" at least monthly and after each use.
- Follow the manufacturer's instructions and CSA Standard Z94.4-11 for care and maintenance.
- Permit only trained, manufacturer-certified personnel to maintain SCBA.
- Do not mix parts from different manufacturers.
- Maintain a complete record for each SCBA facepiece and cylinder.

Facepiece

- Disconnect the facepiece from the breathing apparatus. Wash alone in warm (49-60 °C or 120-140 °F) soapy water using a mild dish detergent.
- Rinse the water through the facepiece by placing the palm of the hand over the breathing tube connector on the exhalation-valve body.
- Remove excess water with a paper towel or lint-free cloth.
- Allow to air dry.
- Sanitize according to the manufacturer's instructions.
- Check for tears in the rubber.
- Check head strap for deterioration.
- Examine lenses for cracks, excessive scratching or other deformities.
- Check rings and clamps securing the lens for bends or bulges in the metal.
- Check the exhalation valve to ensure that it is properly located and that the valve cover is in place.
- Test the exhalation valve. Block the air intake opening and exhale gently. If the exhalation valve is not working properly, a heavy blow-by will be felt at the temples. Inhale and a partial vacuum will be formed.
- Do not mix demand and pressure-demand facepieces and regulators.

Regulator

- Check the regulator, breathing-tube threads, pressure gauge, and bypass and mainline valves for impact damage.
- Store with the cylinder valve completely closed.
- Bleed off air remaining in the regulator after each use, following manufacturer's instructions.

Breathing tube

- Stretch the breathing tube and check for cracks, tears and punctures.
- Check gaskets.
- Check clamps and rings to ensure that they are tight, properly located, not dented and not excessively corroded.
- Wash the breathing tube separately and allow to air dry. If it is permanently attached to the facepiece, allow the breathing tube to dry for several days before using.

High-pressure hose

- Check the hose for cuts, bubbles and abrasions.
- Check the fitting between the high-pressure hose and the regulator for damage.

Audible alarm

- Check the audible alarm for damage.
- Clean bells or whistles.
- Ensure that the alarm is working. If the alarm does not go off when the pressure reaches 20-25% of service time, the unit is defective. Remove the unit from service.

Backpack

- Inspect the straps of the backpack for excessive wear, broken stitching, and damaged or missing hardware.

Cylinder

- Ensure cylinders are hydrostatically tested as set out in CSA Standard Z94.4-11, Selection, Care and Use of Respirators.
- Inspect for cuts or gouges that can cause the unraveling of the composite fibers of the cylinder overwrap.
- Check unwrapped cylinders for impact damage.
- Check for evidence of exposure to heat. Look for discoloured paint or melted gauge lenses.
- Ensure air meets air quality set out in CSA Standard Z180.1-00 (R2010), Compressed Breathing Air and Systems.

Cleaning the rest of the unit

- Remove backpack, cylinder and regulator assembly.
- Clean with water, or soapy water.
- Wipe the regulator, high-pressure hose, audible alarm, air cylinder, backpack and harness with a damp cloth.
- Dry with a cloth.

For more information;

Contact the governmental occupational health and safety officials in your jurisdiction to obtain additional information on regulatory requirements for respiratory protection.

In addition, Canadians can also contact the Canadian Standards Association (CSA) at 416-747-4044 or 1-800-463-6727 to purchase the CSA Standard Selection, care, and use of respirators (CSA Standard Z94.4-11).

Reference Material Sources

- <http://www.ccohs.ca/oshanswers/prevention/ppe/respslct.html>
- <http://www.ccohs.ca/oshanswers/prevention/ppe/respcare.html>
- CSA Standard Selection, Use and Care of Respirators Z94.4-11

“Info Sheet” for Eye and Face Protection

Lenses: The Canadian Standards Association (CSA)-certified safety glasses have plastic polycarbonate lenses. They are stronger than regular lenses, are impact-resistant, and come in prescription and non-prescription (plano or zero-power lens) forms.

Markings on safety glasses: The manufacturer or supplier logo is marked (or etched) on all approved safety lenses, frames (front and temple), removable side shields, and other parts of the glasses, goggles, or helmets.

Frames: Safety frames are stronger than street-wear frames and are often heat resistant. They are also designed to prevent lenses from being pushed into the eyes.

What are the pros and cons of the different lenses?

Comparison of Lens Materials	
Material	Characteristics
Polycarbonate	Strongest material for impact resistance Lightweight Can be coated for scratch resistance Most have built-in UV radiation protection
Plastic (CR39)	About one-half the weight of glass Resistant to solvents and pitting

	More choices for coatings and tinting
Trivex	More impact resistant than CR39 Plastic Less impact resistant than polycarbonate UV radiation absorption properties
Glass	High-density material (heavy lenses) Loses impact resistance if scratched Does not meet impact criteria as set by CSA

From: Z94.3.1-09 Selection, use and care of protective eyewear by Canadian Standards Association, 2009.

If eye protection is required, establish a complete eye safety protection program including selection, fit testing, training, maintenance and inspection.

Fit

- Ensure your safety glasses fit properly. Eye size, bridge size and temple length all vary. Safety glasses should be individually assigned and fitted.
- Wear safety glasses so that the temples fit comfortably over the ears. The frame should be as close to the face as possible and adequately supported by the bridge of the nose.

Care

- Safety glasses need maintenance.
- Clean your safety glasses daily. Follow the manufacturer's instructions. Avoid rough handling that can scratch lenses.
- Scratches impair vision and can weaken lenses.
- Store your safety glasses in a clean, dry place where they cannot fall or be stepped on. Keep them in a case when they are not being worn.
- Replace scratched, pitted, broken, bent or ill-fitting glasses. Damaged glasses interfere with vision and do not provide protection.
- Replace damaged parts only with identical parts from the original manufacturer to ensure the same safety rating.

Selecting the proper safety glasses and face protection.

If you are at risk for eye or face injury at work, you should wear appropriate protection.

To select the proper protectors follow the recommendations in the table below.

Selection of Eye and Face Protection														
<p>Note: This table cannot cover all possible hazards and combinations that may occur. Examine each situation carefully and select the appropriate protector or combination of protectors.</p> <p>*indicates recommended protection</p>	Spectacles (Class 1)		Goggles (Class 2)			Welding Helmet (Class 3)	Welding Hand Shield (Class 4)	Non-Rigid Hoods (Class 5)				Face Shields (Class 6)	<p>Examples</p> <p>Class 1</p> <p>A </p> <p>A </p> <p>B </p> <p>Class 2</p> <p>A </p> <p>B </p> <p>C </p> <p>C </p> <p>Class 3</p> <p></p> <p></p> <p></p> <p>Class 4</p> <p></p> <p></p> <p>Class 5</p> <p></p> <p>Class 6</p> <p></p>	
	A	B	A	B	C			A	B	C	D	A		B
Flying Objects														
Chipping, drilling, scaling, grinding, polishing, buffing, riveting, punching, shearing, hammer mills, crushing, heavy sawing, planing, wire and strip handling, hammering, unpacking, nailing, punch press, lathework, etc.	*		*	*				*	*			*		
Flying particles, dust, wind, etc.														
Woodworking, sanding, light metal working and machining, exposure to dust and wind, resistance welding (no radiation exposure), sand, cement, aggregate handling, painting, concrete work, plastering, material batching and mixing	*		*	*				*	*			*		
Heat, sparks and splash from molten materials														
Babbiting, casting, pouring molten metal, brazing, soldering, spot		*			*					*	*	*	*	

welding, stud welding, hot dipping operations																		
Acid splash, chemical burns																		
Acid and alkali handling, degreasing, pickling and plating operations, glass breakage, chemical spray, liquid bitumen handling				*						*				*				
Abrasive blasting materials																		
Sand blasting, shot blasting, shotcreting				*						*				*				
Glare, stray light (for reduction of visible radiation)																		
Reflecting, bright sun and lights, reflected welding flash, photographic copying	*		*	*						*	*			*				
Injurious optical radiation (moderate reduction of optical radiation)																		
Torch cutting, welding, brazing, furnace work, metal pouring, spot welding, photographic copying		*			*						*				*			
Injurious optical radiation (large reduction of optical radiation)																		
Electric arc welding, heavy gas cutting, plasma spraying and cutting, inert gas shielded arc welding, atomic hydrogen welding						*	*											

From: Z94.3.1-09 Selection, use and care of protective eyewear by Canadian Standards Association, 2009.

Reference Material Sources

- <http://www.ccohs.ca/oshanswers/prevention/ppe/glasses.html>
- (CSA) Standard Z94.3.1-09 Selection, use and care of protective eyewear by Canadian Standards Association, 2009.

“Info Sheet” for Hearing Protection

People should wear a hearing protector if the noise or sound level at the workplace exceeds 85 decibels (dB). Hearing protectors reduce the noise exposure level and the risk of hearing loss.

If hearing protection is required, then a complete hearing conservation program should be instituted. A hearing conservation program includes noise assessment, hearing protector selection, employee training and education, audiometric testing, maintenance, inspection, record keeping, and program evaluation.

The effectiveness of hearing protection is reduced greatly if the hearing protectors do not fit properly or if they are worn only part time during periods of noise exposure. To maintain their effectiveness, they should not be modified. Remember, radio headsets are not substitutes for hearing protectors and should not be worn where hearing protectors are required to protect against exposure to noise.

Select hearing protection that is:

- Correct for the job. Refer to the Canadian Standards Association (CSA) Standard Z94.2-02 (Reaffirmed 2011) "Hearing Protection Devices - Performance, Selection, Care and Use" or contact the agency responsible for occupational health and safety legislation in your jurisdiction for more information.
- Provides adequate protection. Check the manufacturer's literature.
- Comfortable enough to be accepted and worn.

What types of hearing protectors are available?

- **Ear plugs** are inserted to block the ear canal. They may be premolded (preformed) or moldable (foam ear plugs). Ear plugs are sold as disposable products or reusable plugs. Custom molded ear plugs are also available.
- **Semi-insert ear plugs** which consist of two ear plugs held over the ends of the ear canal by a rigid headband.
- **Ear muffs** consist of sound-attenuating material and soft ear cushions that fit around the ear and hard outer cups. They are held together by a head band.

How do I pick my hearing protectors?

The choice of hearing protectors is a very personal one and depends on a number of factors including level of noise, comfort, and the suitability of the hearing protector for both the worker and his environment. Most importantly, the hearing protector should provide the desired noise reduction. It is best, where protectors must be used, to provide a choice of a number of different types to choose from.

If the noise exposure is intermittent, ear muffs are more desirable, since it may be inconvenient to remove and reinsert earplugs.

How can I find out how much a hearing protector can reduce a worker's exposure to noise?

Manufacturers provide information about the noise reducing capability of a hearing protector as an NRR (noise reduction rating) number. The NRR ratings are based on noise reduction obtained in laboratory conditions.

What are the advantages and limitations of ear plugs and ear muffs?

There are advantages and disadvantages associated with the use of either ear muffs or ear plugs.

Ear plugs can be mass-produced or individually molded to fit the ear, and they can be reusable or disposable. On the positive side, they are simple to use, less expensive than muffs, and more comfortable in hot or damp work areas. On the negative side, they provide less protection than some muffs, and should not be used in areas having noise levels over 105 dB(A) (A-weighted decibels). They are not as visible as muffs and a supervisor cannot readily check to see if workers are wearing them. They must be properly inserted to provide adequate protection.

Ear muffs can vary with respect to the material and depth of the dome, and the force of the headband. The deeper and heavier the dome, the greater the low-frequency attenuation provided by the protector. The headband must fit tightly enough to maintain a proper seal, yet not be too tight for comfort. On the positive side, ear muffs can usually provide greater protection than plugs, although this is not always true. They are easier to fit, generally more durable than plugs, and they have replaceable parts. On the negative side, they are more expensive, and often less comfortable than plugs, especially in hot work areas. In areas where noise levels are very high, muffs and plugs can be worn together to give better protection.

The following table summarizes the differences between ear plugs and ear muffs.

Comparison of Hearing Protection	
Ear Plugs	Ear Muffs
<p>Advantages:</p> <ul style="list-style-type: none"> small and easily carried convenient to use with other personal protection equipment (can be worn with ear muffs) more comfortable for long-term wear in hot, humid work areas convenient for use in confined work areas 	<p>Advantages:</p> <ul style="list-style-type: none"> less attenuation variability among users designed so that one size fits most head sizes easily seen at a distance to assist in the monitoring of their use not easily misplaced or lost may be worn with minor ear infections
<p>Disadvantages:</p> <ul style="list-style-type: none"> requires more time to fit more difficult to insert and remove require good hygiene practices may irritate the ear canal 	<p>Disadvantages:</p> <ul style="list-style-type: none"> less portable and heavier more inconvenient for use with other PPE more uncomfortable in hot, humid work area more inconvenient for use in confined work areas

easily misplaced	may interfere with the wearing of safety or prescription glasses:
more difficult to see and monitor	wearing glasses results in breaking the seal between the ear muff
usage	and the skin and results in decreased hearing protection.

Why is user preference so important?

The human aspects of hearing protection are particularly important since the only useful kind of protection is the protection that is actually worn. Some people do not accept particular kinds of protectors; every human being is different, and the anatomy of the ear and ear canal can vary significantly from person to person.

It is a good idea for the employer to provide a number of different types of hearing protection from which workers can choose, keeping in mind any safety or hygienic reasons for not providing a particular kind of protector. That is, a particular type of protector should not be used if noise levels are too high or if it proves to be inadequate from a hygienic point of view. For example, ear plugs which are used in a plant setting where people reuse them throughout the day, often reinserting them with dirty fingers, can introduce dirt and bacteria into the ears, causing ear infections.

The bottom line on hearing protection is worker preference. If the workers do not like the type of protection (for example, if it is uncomfortable, does not fit well, or is impractical), they will not wear it.

Follow manufacturers' instructions. With ear plugs, for example, the ear should be pulled outward and upward with the opposite hand to enlarge and straighten the ear canal, and insert the plug with clean hands.

- Ensure the hearing protector tightly seals within the ear canal or against the side of the head. Hair and clothing should not be in the way.

What happens to the protection level when hearing protectors are removed for short periods of time?

In order to get full benefit, hearing protectors must be worn all the time during noisy work. If hearing protectors are removed only for a short duration, the protection is substantially reduced.

The following table gives a maximum protection provided for non-continuous use of an ideally fitted "100%" efficient hearing protector. For example if one takes off his/her hearing protector for 5 min in a 8-hour shift, the maximum protection will be 20 dB.

Maximum protection provided by non-continuous use of Hearing Protection	
Percent time used	Maximum Protection

50%	3 dB
60%	4 dB
70%	5 dB
80%	7 dB
90%	10 dB
95%	13 dB
99%	20 dB
99.9%	30 dB

Ear protectors must be used **ALL THE TIME** to get full benefit.

How should I care for my hearing protection device?

- Follow the manufacturer's instructions.
- Check hearing protection regularly for wear and tear.
- Replace ear cushions or plugs that are no longer pliable.
- Replace a unit when head bands are so stretched that they do not keep ear cushions snugly against the head.
- Disassemble ear muffs to clean.
- Wash ear muffs with a mild liquid detergent in warm water, and then rinse in clear warm water. Ensure that sound-attenuating material inside the ear cushions does not get wet.
- Use a soft brush to remove skin oil and dirt that can harden ear cushions.
- Squeeze excess moisture from the plugs or cushions and then place them on a clean surface to air dry. (Check the manufacturer's recommendations first to find out if the ear plugs are washable.)

Reference Material Sources

- http://www.ccohs.ca/oshanswers/prevention/ppe/ear_prot.html
- (CSA) Standard Z94.2-02 (Reaffirmed 2011) "Hearing Protection Devices - Performance, Selection, Care and Use"

“Info Sheet” for Head Protection

What should I know about head protection?

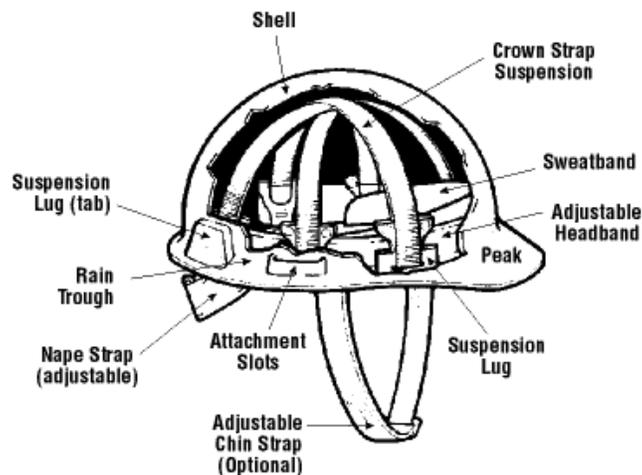
- If you are at risk for head injury at your workplace, you should wear the appropriate head protection.
- If head protection is required, establish a complete safety protection program including selection, fit testing, training, maintenance and inspection.
- Choose the correct headwear for the job. Refer to CSA Standard Z94.1-05 "Industrial Protective Headwear - Performance, Selection, Care, and Use" or the legislation that applies in your jurisdiction.

Classes of headwear can include:

- Type 1 - protection from impact and penetration at the crown (top) and
- Type 2 - protection from impact, penetration at the crown (top) and laterally (sides)

Each type is also available in the following classes:

- Class E (20 000 V electrical rating) - non-conducting material (electrical trades)
- Class G (2200 V electrical rating) - non-conducting material (general trades)
- Class C (no electrical rating)



- Headwear consists of a shell and the suspension. These work together as a system and both need regular inspection and maintenance.
- Do not transport headwear in rear windows of vehicles. Heat and UV light can damage the material, making it brittle and less protective.
- Inspect headwear before each use.
- Always check with the manufacturer when adding or using accessories (non-metallic stickers, tape, bandanas, hankerchiefs, etc.).
- Winter liners should be inspected to ensure they do not interfere with fit of headwear.
- × Do not draw the chin strap over the brim or peak of the headwear.

- × Do not wear baseball style hats under the headwear as it interferes with the suspension.
- ✓ Only wear the hard hat with the peak at the back, if the suspension has been adjusted so the nape strap remains at the back of the head. Check with the manufacturer to ensure the headwear was designed to be worn this way.



Correct application of reversed hard hat with nape strap at back of head

What should I know about the shell of my headwear?

The shell is rigid and light, and is shaped to deflect falling objects. Correct maintenance is important.

DO:

- ✓ Inspect and replace a shell that shows signs of wear, scratches or gouges. Shells exposed to heat, sunlight and chemicals can become stiff or brittle. A visible pattern of tiny cracks may develop. Over time, weathered hats can become dull in colour or have a chalky appearance.
- ✓ Replace headwear when any of the above signs of wear start to appear.
- ✓ Replace headwear that has been struck, even if no damage is visible.
- ✓ Remove and destroy any headwear if its protective abilities are in doubt.

DO NOT:

- × Do not drill holes, alter or modify the shell. Alterations may reduce the protection provided by the headwear.
- × Do not paint the plastic shell. Paint solvents can make plastic headwear brittle and more susceptible to cracks. Paint can also hide cracks that may develop. Instead, use reflective marking tape to make numbers or symbols for identification purposes. Some headwear may be painted, but check with the manufacturer for approval.
- × Do not use winter liners that contain metal or electrically conductive material under Class G or E headwear.
- × Do not use metal labels on Class G or E headwear.

What should I know about the suspension of my headwear?

The suspension system is as important as the shell. It holds the shell away from the head and acts as a shock-absorber. It also holds the shell in place on the head and allows air to flow freely.

- ✓ Adjust headband size so that headwear will stay on when the wearer is bending over, but not so tight that it leaves a mark on the forehead.

- ✓ Ensure that the suspension is in good condition. The main purpose of the suspension is to absorb energy.
- ✓ Look closely for cracked or torn adjustment slots, frayed material or other signs of wear.
- ✓ Check the suspension lugs carefully. Long periods of normal use can damage the suspension. Perspiration and hair oils can speed up the deterioration of suspension materials.
- ✓ Replace the suspension if it has torn or broken threads.

- × Do not put anything between the suspension and the shell. There must be a clearance inside the headwear while it is being worn. In case of a blow to the head, that space helps absorb the shock.
- × Do not use a suspension made by one manufacturer with products made by another manufacturer.
- × Do not change or alter any of the suspension, liner or shell.

What should I know about maintenance?

The care and maintenance of headwear are needed if the headwear is to protect as designed. Its lifespan is affected by normal use and by heat, cold, chemicals and ultraviolet rays.

Clean the suspension and shell regularly according to the manufacturers' instructions.

Reference Material Sources

- <http://www.ccohs.ca/oshanswers/prevention/ppe/headwear.html>
- CSA Standard Z94.1-05 "Industrial Protective Headwear - Performance, Selection, Care, and Use"