

Section:	Occupational Health and Safety Management System	Issued By:	Environmental Health and Safety
		Issued Date:	2013.11.22
Document:	Personal Protective Equipment Program	Revised Date:	2017.02.22
		Reviewed Date:	
Pages:	18	Revision #:	1
		By:	JF

Table of Contents

1.0 Purpose	2
2.0 Scope.....	2
3.0 Responsibilities	2
3.1 Supervisors are responsible for:.....	2
3.2 Workers are responsible for:.....	2
3.3 Contractors are responsible for:	3
3.4 Environmental Health and Safety is responsible for:	3
4.0 Training	3
5.0 Types of PPE and Uses	3
5.1 Eye Protection	3
5.1.1 CSA Classes of Eye Protection	4
5.1.2 Hazards and Recommended Eye and Face Protectors.....	6
5.2 Flame Resistant Clothing	7
5.3 Foot Protection.....	7
5.3.1 Protective Footwear Markings	7
5.3.2 Use of Toecaps.....	8
5.4 Head Protection	9
5.4.1 Standards.....	9
5.4.2 Protective Headwear Use	10
5.4.3 Bicycles and Skates	10
5.4.4 Small Utility Vehicles, All-Terrain Vehicles, Snow Vehicles, and Motorcycles	10
5.4.5 Bump Hats	11
5.4.6 Work at Heights or in Confined Spaces	11
5.4.7 Exemption from Wearing Headwear	11
5.5 Respiratory Protective Equipment	11
5.5.1 Hazard Assessment and Control Form	11
5.5.2 Code of Practice.....	12
5.5.3 Approval of Equipment.....	12
5.5.4 Quality of Breathing Air.....	13
5.5.5 Emergency Escape Equipment.....	13
5.6 Limb and Body Protection	13
5.6.1 Hand and Arm Protection	13
5.6.2 Torso Protection	14
5.6.3 Foot and Leg Protection	14
5.7 Life Jackets and Personal Flotation Devices (PFD).....	15
5.8 Hearing Protection	15
5.9 Fall Protection	16
6.0 Definitions.....	16
7.0 Related Documents.....	17
8.0 References and Additional Resources	17

The electronic version is the official version of this standard.

1.0 Purpose

This program has been developed with reference to Part 18 of the Alberta Occupational Health and Safety (OH&S) Code to aid in minimizing worker exposure to hazards present in the workplace as well as to aid in understanding the proper selection and use of Personal Protective Equipment (PPE).

2.0 Scope

The University of Calgary recognizes and adheres to the hierarchy of controls expressed in the Alberta OH&S Code where hazard elimination, the use of engineering controls, and the use of administrative controls supersede the use of PPE as a hazard control measure.

3.0 Responsibilities

For any PPE requirements not covered within this program or any questions regarding the appropriate selection of PPE, please contact Environmental Health and Safety.

3.1 Supervisors are responsible for:

- being familiar with the PPE Program;
- ensuring workers are familiar with and follow this Program;
- completing a Hazard Assessment and Control Form (HACF) prior to any work being undertaken;
- reviewing and updating the HACF post incident or when changes to the operation are implemented (i.e. new equipment or a process is introduced);
- selecting PPE in accordance with legislated requirements;
- maintaining training records in personnel files;
- ensuring that the PPE is appropriate for the work activities and does not present a risk to workers (e.g. loose high-visibility vests around belt driven equipment, dirty safety glasses, etc.)
- ensuring workers properly use and wear PPE;
- ensuring that all workers review the HACF and are trained in the correct use, care, limitations, and maintenance requirements of all PPE;
- ensuring that all required PPE is maintained and inspected as per manufacturer specifications; and
- ensuring workers complete a Field Level Hazard Assessment (FLHA) for any non-routine work activities.

3.2 Workers are responsible for:

- being familiar with and following this Program;
- completing a FLHA prior to any non-routine work activities;
- wearing or using, maintaining, and inspecting all required PPE as per manufacturer specifications;
- never altering PPE to perform any function other than intended;
- following all health and safety standards, rules, and regulations, and reporting all hazardous conditions to their supervisor immediately;
- participating in required training; and
- reviewing the completed HACF.

The electronic version is the official version of this standard.

3.3 Contractors are responsible for:

- following the University's PPE Program where the requirements exceed a Contractor's Program and/or the OH&S Code;
- honouring the University's contractual requirements;
- employing competent and qualified workers; and
- supplying their own PPE.

3.4 Environmental Health and Safety is responsible for:

- periodically auditing recordkeeping;
- providing support to supervisors and workers;
- fit testing workers required to wear respiratory protective equipment; and
- reviewing and updating the PPE program as necessary.

4.0 Training

After proper PPE has been selected, supervisors must provide PPE to workers and train them in its proper use. Required PPE will be supplied to the worker by their Department as per Department stipulations.

Training records must be maintained using a system appropriate for the users but should include at a minimum worker name, date, type of PPE, make/model, worker signature, and name of trainer. PPE selection must be reviewed, and if necessary training provided, if there are changes to an operation or a new process is introduced. At a minimum, each employee using PPE must know and understand:

- when PPE is necessary;
- what PPE is necessary and which PPE has been selected;
- compatibilities of PPE (e.g. ear muffs for hard hats, welding helmets with respirators, etc.)
- how to properly don, doff, adjust, and wear PPE;
- the limitations of the PPE;
- how to determine if PPE is no longer effective or is damaged;
- how to get replacement PPE; and
- how to properly care for, maintain, store, and dispose of PPE.

5.0 Types of PPE and Uses

5.1 Eye Protection

If a worker's eyes may be injured or irritated at a work site, an employer must ensure that the worker wears properly fitted eye protection that is appropriate to the work being completed and the hazards associated with the job.

Eye protection equipment must be Canadian Standards Association (CSA) approved as the American National Standards Institute (ANSI) standards are not recognized by the Alberta OH&S code for eye protection, with the exception of the following:

- prescription safety eyewear frames can meet the ANSI standards provided the lenses meet CSA standards;
- full face respirators intended to protect the eyes must meet impact and penetration test requirements of ANSI standards in addition to CSA standard requirements; and
- prescription safety eyewear requiring the use of glass lenses as opposed to plastic lenses.

The electronic version is the official version of this standard.

Welders performing electric arc welding are responsible for ensuring all workers in the area are protected from exposure to radiation created by the arc. Arc welding should be conducted behind a protective screen and/or workers in adjacent areas advised to wear appropriate eye protection.

5.1.1 CSA Classes of Eye Protection

The CSA Standards group eye and face protection into seven classes as follows:

- Class 1 – Spectacles
 - Class 1A: spectacles for impact protection with side protection
 - Class 1B: spectacles for impact and radiation protection with side protection



Class 1A
Spectacles with side protection



Class 1B
Spectacles with side and radiation protection

- Class 2 – Goggles
 - Class 2A: goggles for impact protection with direct ventilation
 - Class 2B: goggles for impact, dust and splash protection; non-ventilated and indirectly ventilated
 - Class 2C: goggles are Class 2A or 2B goggles with radiation protection



Class 2A
Direct ventilated goggles



Class 2B
Non-ventilated goggles



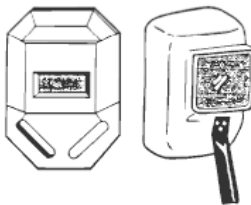
Class 2C
Direct/non-ventilated with radiation protection



- Class 3 – Welding Helmets (this Class includes a variety of configurations)



- Class 4 – Welding Hand Shields (this Class includes a variety of configurations)



The electronic version is the official version of this standard.

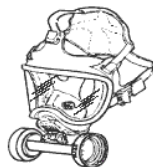
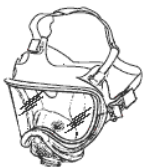
- Class 5 – Non-Rigid Helmets (hoods)
 - Class 5A: non-rigid helmets have an impact-resistant window
 - Class 5B: non-rigid helmets are intended for dust, splash and abrasive materials protection
 - Class 5C: non-rigid helmets have radiation protection
 - Class 5D: non-rigid helmets are intended for high-heat applications



- Class 6 – Faceshields
 - Class 6A: faceshields offer impact and splash protection
 - Class 6B: faceshields offer radiation protection
 - Class 6C: faceshields are intended for high-heat applications



- Class 7 – Respirator Facepieces
 - Class 7A: respirator facepieces offer impact and splash protection
 - Class 7B: respirator facepieces are Class 7A respirator facepieces with radiation protection
 - Class 7C: respirator facepieces have loose-fitting hoods or helmets
 - Class 7D: respirator facepieces are Class 7C respirator facepieces with radiation protection



Class 7A
Respirator facepiece for impact and splash protection

Class 7B
Respirator facepiece for non-ionizing radiation protection



Class 7C
Respirator facepiece with loose-fitting hood or helmet



Class 7D
Respirator facepiece with loose-fitting hood or helmet for non-ionizing radiation protection

The electronic version is the official version of this standard.

5.1.2 Hazards and Recommended Eye and Face Protectors

Nature of hazard	Typical hazardous activities	Spectacles Class 1		Goggles Class 2			Welding helmet Class 3	Welding hand shields Class 4	Non-rigid hoods Class 5				Faceshields Class 6			
		A	B	A	B	C			A	B	C	D	A	B	C	
Flying objects	Chipping, scaling, stonework, drilling, grinding, buffing, polishing, etc; hammer mills, crushing, heavy sawing, planing; wire and strip handling; hammering, unpacking, nailing; punch press, lathe work, etc.	✓		✓	✓				✓	✓				✓		
Flying particles, dust, wind, etc.	Woodworking, sanding; light metalworking and machining; exposure to dust and wind; resistance welding (no radiation exposure); sand cement, aggregate handling; painting; concrete work, plastering; material batching and mixing	✓		✓	✓				✓	✓				✓		
Nature of hazard	Typical hazardous activities	Spectacles Class 1		Goggles Class 2			Welding helmet Class 3	Welding hand shields Class 4	Non-rigid hoods Class 5				Faceshields Class 6			
		A	B	A	B	C			A	B	C	D	A	B	C	
Heat, sparks, and splash from molten materials	Babbling, 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	Reflection, bright sun, and lights; reflected welding flash; photographic copying	✓		✓	✓				✓	✓				✓		
Optical radiation that can injure the eyes (where moderate reduction of optical radiation is required)	Torch cutting, welding, brazing, furnace work; metal pouring, spot welding, photographic copying		✓			✓					✓				✓	
Optical radiation that can injure the eyes (where large reduction of optical radiation is required)	Electric arc welding; heavy gas cutting; plasma spraying and cutting; inert gas shielded arc welding; atomic hydrogen welding						✓	✓								

Source: Based on Table A.1 of CSA Standard Z94.3-02 Eye and Face Protectors

The electronic version is the official version of this standard.

5.2 Flame Resistant Clothing

Flash fires and explosions are common hazards at a variety of workplaces. These hazards are present in work areas where flammable materials are present, handled, processed, or stored. If a worker may be exposed to a flash fire or electrical equipment flashover the worker must wear flame resistant clothing. Clothing worn beneath flame resistant clothing must be made of flame resistant fabrics or natural fibres that will not melt when exposed to heat.

For electrical equipment flashovers, many employers refer to CSA Standard Z462-08 *Workplace Electrical Safety*. Although this standard is not referenced in the OH&S Code, many employers reference this standard in determining outerwear ratings and PPE requirements; as such this standard has become an industry best practice.




5.3 Foot Protection

A worker must use footwear that is appropriate to the hazards associated with the work being performed. A HACF must be completed to determine appropriate footwear based on task-based and/or environmental hazards.

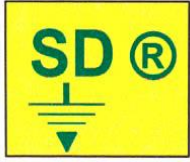
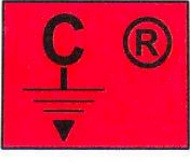

If the HACF identifies that protective footwear needs to have toe protection, a puncture resistant sole, metatarsal protection, electrical protection, chainsaw protection, or a combination, the protective footwear must be in compliance with the following standards:

- CSA Standard Z195-02, *Protective Footwear*; or
- ASTM Standard F2413-05, *Specification for Performance Requirements for Protective Footwear*.

5.3.1 Protective Footwear Markings

Outside Labels	Location	Criteria	Application
	The label will appear on the outer side or on the tongue of the right shoe.	Green triangle indicates sole puncture protection with a Grade 1 protective toe to withstand impacts up to 125 joules. Comparable to a 10 kg weight dropped 1.3 metres.	For any industry, especially construction, where sharp objects (such as nails) are present, heavy work environments.
	The label will appear on the outer side or the tongue of the right shoe.	Yellow triangle indicates sole puncture protection with a Grade 2 protective toe to withstand impacts up to 90 joules. Comparable to a 10 kg weight dropped 0.9 metres.	For light industrial work environments requiring puncture protection, as well as toe protection.
	The label will appear on the outer side or on the tongue of the right shoe.	White rectangle with orange Greek letter Omega indicates soles that provide resistance to electrical shock.	For any industry where accidental contact with live electrical conductors can occur. <i>Warning: Electrical Shock Resistance deteriorates with wear and in a wet environment.</i>

The electronic version is the official version of this standard.

Outside Labels	Location	Criteria	Application
	The label will appear on the outer side or on the tongue of the right shoe.	Yellow rectangle with green "SD" and grounding symbol indicates soles are static dissipative.	For any industry where a static discharge can create a hazard for worker or equipment.
	The label will appear on the outer side or on the tongue of the right shoe.	Red rectangle with black "C" and grounding symbol indicates soles are electrically conductive.	For any industry where static discharge may create a hazard of explosion.
	The label will appear on the outer side or on the tongue of the right shoe.	White label with green fir tree symbol indicates chain saw protective footwear.	For forestry workers and others exposed to hand-held chain saws or other cutting tools.

Note: The ® appearing on the labels represents the mark or label of the nationally accredited testing organization that evaluated and approved the footwear.

Source: CSA Special Publication Z195.1-02 Guideline on Selection, Care, and Use of Protective Footwear

5.3.2 Use of Toecaps

The use of safety toecaps as an alternative to approved protective footwear is limited by several conditions:

- the affected worker must be able to provide the employer with a medical certificate, signed by a physician, indicating that the worker is unable, for medical reasons, to wear approved footwear;
- the safety toecaps must, at a minimum, meet the impact force test requirements for footwear of CSA Standard Z195-02, Protective Footwear or ASTM Standard F2413-05, Specification for Performance Requirements for Protective Footwear. The impact force required is based on the type of foot hazard the worker is exposed to. For example, if the worker needs Grade 1 protection, then the toecap must be able to withstand the impact force required by Grade 1 foot protection. The purpose of the toecaps is to provide impact protection. Toecaps are not an acceptable replacement for, for example, protective footwear offering chain saw protection;
- safety toecaps are not suitable replacements for integral metatarsal protectors. If the worker is exposed to metatarsals hazards, then safety toecaps cannot be used;
- safety toecaps do not have soles capable of providing protection against sharp objects penetrating the soles of shoes with which the toecaps are being used. If the worker is exposed to sole penetration hazards, then safety toecaps cannot be used; and
- safety toecaps may present a tripping hazard, an electrical safety hazard if made of conductive materials, etc. The employer must take these factors into consideration when determining if safety toecaps can be used as a safe and effective alternative to approved protective footwear.

The electronic version is the official version of this standard.

5.4 Head Protection

If there is a possibility of injury to a worker's head and there is a significant risk of lateral or side impact to the head, a worker must wear industrial protective headwear that is appropriate to the hazards.

Industrial protective headwear must be in compliance with the following standards:

- CSA Standard CAN/CSA Z94.1-05, *Industrial Protective Headwear*; or
- ANSI Standard Z89.1-2003, *American National Standard for Industrial Head Protection*, for Type II head protection.

Examples of head protection:



5.4.1 Standards

CSA Standard

CSA Standard Z94.1-05, *Industrial Protective Headwear*, applies to headwear intended to protect the heads of industrial workers. The Standard defines the areas of the head that are to be protected and includes basic performance requirements for impact protection, object penetration, stability and dielectric properties. The Standard divides protective headwear into three Classes according to its intended use:

- *Class G (General Use)* – intended to provide workers with protection against impact and penetration; headwear is non-conducting and undergoes dielectric-strength test of 2,200 volts; provides limited protection against electric shock.
- *Class E (Electrical Trades)* – intended to provide workers with protection against impact and penetration; headwear is non-conducting and undergoes dielectric-strength test of 20,000 volts; provides improved protection against electric shock.
- *Class C (Conducting Headwear)* – intended to provide the user with protection against impact and penetration only; headwear is conducting.

Protective headwear meeting the CSA requirements may have a brim around the entire circumference of the shell or have a partial brim with a peak.

ANSI Standard

The ANSI Standard applies to protective helmets intended to provide limited protection for the head against impact, flying particles, electric shock, or any combination of these hazards. The Standard divides protective helmets into two types and three classes according to their intended use. Type I helmets are intended to reduce the force of impact resulting from a blow only to the top of the head. Type II helmets are intended to reduce the force of impact resulting from a blow that may be received off-centre or to the top of the head. The three classes are as follows:

The electronic version is the official version of this standard.

- *Class G (General)* – intended to reduce the danger of contact exposure to low voltage conductors; undergoes dielectric-strength test of 2,200 volts; typically used in mining, construction, shipbuilding, tunnelling, lumbering, and manufacturing.
- *Class E (Electrical)* – intended to reduce the danger of contact exposure to high voltage conductors; undergoes dielectric-strength test of 20,000 volts; used extensively by electrical workers.
- *Class C (Conductive – no electrical protection)* – designed specifically for lightweight comfort and impact protection; does not undergo dielectric-strength testing; typically used in manufacturing, oil fields, refineries and chemical plants where no danger from electrical hazards or corrosion exist.

Protective headwear meeting the ANSI requirements may have a brim around the entire circumference of the helmet shell or have a partial brim with a peak.

5.4.2 Protective Headwear Use

Industrial headwear is designed to absorb some of the energy of a blow through partial destruction of its component parts. Headwear that has experienced a severe impact should be replaced even though it may not appear to be damaged.

For maximum head protection, the headwear's shell and suspension should be checked according to the manufacturer's instructions before each use. If the shell or linings are found to have a crack, dent, or hole, or if the suspension is torn or broken, the headwear should either be discarded or the particular part replaced with an identical part from the original manufacturer.

Unless permitted by the manufacturer's written instructions:

- headwear must not be painted or cleaned with solvents;
- adhesives used on applied decals must not interact with the headwear material to reduce its strength;
- headwear users should not carry or wear anything inside their protective headwear; and
- headwear must not be worn backwards.

5.4.3 Bicycles and Skates

Operators of bicycles, in-line skates, three-wheeled cycles, skateboards, or roller skates as a form of transport are required to wear a cycling helmet approved to one of the standards listed in Section 235(1) of the Alberta OH&S code.

A hard hat may be worn in place of a cycling helmet as long as speeds do not exceed 20 km/hr and the hard hat is equipped with a chin strap that is worn by the operator.

5.4.4 Small Utility Vehicles, All-Terrain Vehicles, Snow Vehicles, and Motorcycles

Operators of all-terrain vehicles, snow vehicles, motorized trail bikes, motorcycles, or small utility vehicles must wear protective headwear meeting the requirements of CSA/ANSI standards.

If a small utility vehicle is equipped with seat belts and rollover protection, then operators are not required to wear a safety helmet. This is only acceptable as long as there are written procedures in place requiring the use of seat belts and rollover protection has been confirmed with the manufacturer.

Headwear requirements for operators of all-terrain vehicles, snow vehicles, motorized trail bikes, or motorcycles does not apply if they are equipped with rollover protective structures meeting requirements as outlined in Part 19 Section 270 and seat belt requirements as outlined in Part 19 Section 271 of the Alberta OH&S code.

5.4.5 Bump Hats

Bump hats are not equipped with a shock-absorbing liner and suspension system that can absorb the energy of an object striking the headwear. Bump hats are intended for use in situations where the danger of injury is limited to striking the head against stationary objects.

5.4.6 Work at Heights or in Confined Spaces

Working at heights or in confined spaces requires the use of head protection equipped with a chin strap. The use of a chin strap is required at heights to prevent the head protection from falling off either during work activities or during a fall arrest situation. Chin strap use reduces the risk of a head injury for the worker, rescue of an unconscious worker, and personnel working below being struck by falling head protection.

Confined space work often requires workers to be in positions where the head protection could fall off and/or become a nuisance (e.g. obscuring vision). A chin strap reduces the risk of a head injury for the worker and maintains head protection in a secure position.

5.4.7 Exemption from Wearing Headwear

To perform certain functions, workers may need to remove their protective headwear. When this is the case, the employer must ensure that an adequate alternative means of protecting the worker's head during the work process is in place. If the falling object hazard is still present after the work process is completed, the worker must immediately return to wearing his or her protective headwear.

5.5 Respiratory Protective Equipment

Respiratory protective equipment comes in a variety of models, sizes, and styles in order to provide protection against various hazards to which a person may be exposed. Following are some examples of respiratory protective equipment:



5.5.1 Hazard Assessment and Control Form

Completion of the HACF will determine if a worker is required to use a respirator based on an assessment of the following:

- potential or known exposure to an airborne contaminant or a mixture of airborne contaminants in a concentration exceeding their occupational exposure limits;
- potential or known exposure to an atmosphere with an oxygen concentration of less than 19.5 percent by volume; or

The electronic version is the official version of this standard.

- potential or known exposure to an airborne bio-hazardous material such as:
 - sewage plant workers exposed to aerosols created during effluent processing or during equipment maintenance;
 - laboratory workers exposed to aerosols while handling biohazardous materials;
 - health care workers exposed to airborne biohazardous materials;
 - rendering plant workers exposed to aerosols created during materials processing;
 - workers involved in renovations removing mouldy building materials; and
 - workers stirring up dusts containing waste products from animals such as birds, bats and mice.

5.5.2 Code of Practice

The Alberta OH&S code requires a written code of practice for workplaces that use respiratory protective equipment. The University of Calgary has a Respiratory Protection Program that includes elements of a Code of Practice such as documentation on the selection, use, care, and maintenance of respirators. The Respiratory Protection Program also includes qualitative and quantitative fit-testing services for any University employees required to wear a respirator.

5.5.3 Approval of Equipment

Respiratory protective equipment must be approved by the National Institute for Occupational Safety and Health (NIOSH) and/or another standard setting and equipment testing organization that is approved by a Director of Occupational Hygiene.

According to NIOSH, particulate respirators are categorized on the basis of efficiency and on their resistance to penetration by oil. Oil degrades and reduces the filtering efficiency of the filter material. NIOSH certifies the following three classes of particulate filters:

- N-series (not resistant to oil);
- R-series (resistant to oil); and
- P-series (oil proof).

Particulate filters are also certified according to their filter efficiency at removing particles 0.3 micrometers in diameter. For example N95 denotes that the filter is not resistant to oil and is at least 95% efficient at filtering out 0.3 micrometer diameter particles.

Classes of filters certified by NIOSH:

Filter Series	Filter Type Designation	Minimum Efficiency (%)	Comments
"N" Series	N100	99.97	May be used for any solid or non-oil containing particulate.
	N99	99	
	N95	95	
"R" Series	R100	99.97	May be used for any particulate contaminant. May only be used for one shift if used for an oil-containing particulate.
	R99	99	
	R95	95	
"P" Series	P100	99.97	May be used for any particulate
	P99	99	
	P95	95	

The electronic version is the official version of this standard.

5.5.4 Quality of Breathing Air

The air delivered to a person wearing a self contained breathing apparatus (SCBA) or a supplied air breathing apparatus (SABA) must be as free of contaminants as possible. Contaminants may harm the person breathing the air or may damage the respiratory protective equipment being used. As a result, the employer must ensure the air is of a quality that complies with Table 1 of CSA Standard Z180.1-00 (R2005), *Compressed Breathing Air and Systems*.

In addition, breathing air cannot contain a substance in a concentration that exceeds 10% of its occupational exposure limit.

5.5.5 Emergency Escape Equipment

Normal operating conditions at a work site or work area may not require respiratory protective equipment to be worn. However, emergency conditions may develop that require a worker to use respiratory protective equipment while the worker evacuates the work area.

In cases like this where the employer's hazard assessment has identified that a contaminant may suddenly enter a work area, the nature of the contaminant must be known and workers in that area must be provided with appropriate protection from that contaminant.

5.6 Limb and Body Protection

If a workers hand, arm, leg or torso has the potential to be injured, they must wear hand, arm, leg, or body protective equipment suitable to the work being performed and the hazards present.

If a worker must handle substances that may damage the skin on contact or be absorbed through the skin, effective and appropriate protective clothing or equipment must be used. The performance characteristics of gloves must match the specific hazard(s) that workers will encounter e.g. exposure to chemicals, heat, or flames. For example, for protection against chemical hazards, the toxic properties of the chemical(s) must be known, particularly the ability of the chemical(s) to pass through the skin and affect the worker.

5.6.1 Hand and Arm Protection

Examples of injuries to arms and hands include burns, cuts, electrical shock, amputation and absorption of chemicals. To select appropriate protection, work activities should be reviewed to determine how much finger dexterity is needed to safely do the work, the duration, frequency, and degree of exposure to hazards, and the physical stresses that will be applied.

There is a wide assortment of gloves, sleeves, and wristlets for protection against various hazards:



The electronic version is the official version of this standard.

5.6.2 Torso Protection

Exposure to heat, splashes from hot metal and liquids, impacts, cuts, acids, and radiation can injure the torso. A variety of protective clothing is available such as vests, jackets, aprons, coveralls and full body suits.

Heat-resistant materials such as leather are often used in protective clothing to guard against dry heat and flame. Rubber and rubberized fabrics, neoprene, and plastic offer protection against some acids and chemicals. Manufacturer's specifications and selection guides should be consulted for information about the effectiveness of specific materials against specific chemicals.

Disposable suits of plastic-like or other similar synthetic materials are particularly important for protection from dusty materials or materials that can splash. If the substance is extremely toxic, a completely enclosed chemical suit may be necessary. The clothing should be inspected to ensure proper fit and function for continued protection.

Examples of torso protection:



5.6.3 Foot and Leg Protection

To protect the feet and legs from falling or rolling objects, sharp objects, molten metal, hot surfaces, and wet slippery surfaces, workers must use protective footwear. Appropriate footguards, boots, leggings and chaps protect the legs and feet from molten metal or welding sparks.

Aluminum alloy, fibreglass, or galvanized steel footguards can be worn over work shoes, although they may catch on objects and cause workers to trip. Heat-resistant soled shoes protect against hot surfaces like those found in the roofing, paving, and hot metal industries.

Examples of foot and leg protection:



The electronic version is the official version of this standard.

5.7 Life Jackets and Personal Flotation Devices (PFD)

If a worker may be exposed to the hazard of drowning, they must wear a life jacket or a personal flotation device. If workers are being transported by boat, lifejackets must be worn. However, a personal flotation device may be worn when work is being performed from a boat for an extended period of time and when a life jacket is still readily accessible to each worker on the boat.

A life jacket is designed to provide support for the head and has the capacity to turn an unconscious person from face down to face up in the water allowing them to breathe. Standard life jackets are 'keyhole' style and must be orange, yellow, or red with a whistle attached. Life jackets should be selected as per CGSB Standard CAN/CGSB 65.7-M88 AMEND, *Lifejackets, Inherently Buoyant Type*. The following are examples of life jackets:



Personal flotation devices are generally more commonly used although they are not always designed to turn an unconscious person from a face down position to a face up position in the water. Personal flotation devices are usually a vest or 'keyhole' style, are typically yellow, orange, or red, and can be an inflatable version. A personal flotation device should be selected as per CGSB Standard CAN/CGSB 65.11-M88 AMEND, *Personal Flotation Device*. The following are examples of personal flotation devices:



5.8 Hearing Protection

Earmuffs and ear plugs are the main types of hearing protection typically used and are available in various sizes, shapes, and degree of protection. The University of Calgary has a Hearing Conservation Program designed to protect workers from hearing loss due to occupational noise exposure. This program includes:

- roles and responsibilities;
- hazard identification, assessment, and control;
- noise surveys, personal dosimetry, and audiometric testing;
- worker education and training; and
- record keeping and program review requirements.

The Hearing Conservation Program provides further information on the selection, use, care, and maintenance of noise-related PPE in accordance with Part 16 of the Alberta OH&S Code.

The electronic version is the official version of this standard.

5.9 Fall Protection

Any time a worker is exposed to a fall hazard, a procedure and/or equipment will be identified to reduce or eliminate the hazard of working at heights. The University of Calgary has a Fall Protection Program designed to prevent occupational injuries due to falls. This program includes:

- responsibilities;
- training;
- hazard identification, assessment, and control;
- anchor and equipment use;
- design standards; and
- rescue from heights.

The Fall Protection Program provides further information on the selection, use, care, and maintenance of fall-related PPE in accordance with Part 9 of the Alberta OH&S Code.

6.0 Definitions

Administrative Controls	means processes developed by the employer to control hazards not eliminated by engineering controls (e.g. safe work policies, practices and procedures, job scheduling or rotation, and training).
Biohazardous Material	means a pathogenic organism, including bloodborne pathogens with the ability to cause disease in humans.
Dielectric	means the ability of a material to resist passage of an electric current.
Director of Occupational Hygiene	means a member of Alberta Government Human Services.
EHS	means Environmental Health and Safety.
Employee	means an individual who is engaged to work for the University under a contract of service, that is, there is an employer-employee relationship between the individual and the University. For clarity, this term includes support staff, management and professional staff, the senior administration group, researchers, graduate students who are remunerated by the University, and faculty members.
Engineering Controls	is the preferred method of hazard control if elimination is not possible; physical controls implemented at the design, installation, or engineering stages (e.g. local exhaust ventilation, fume hoods, etc.).
Formal Hazard Assessment and Control Form	is the identification of all jobs and tasks performed by employees, assessment of the hazards associated with each task and the prioritization of the hazards based on the level of risk they pose. At the University of Calgary, formal hazard assessments are completed using the Hazard Assessment and Control Form (HACF).

The electronic version is the official version of this standard.

Hazard	means a situation, condition or thing that may be dangerous to the safety or health of workers. <i>Alberta OHS Code (2009)</i> .
Hazard Control	means methods used to eliminate or control loss and include Engineering Controls, Administrative Controls and Personal Protective Equipment.
Metatarsal	means any bone of the foot between the ankle and the toes.
PPE	means Personal Protective Equipment used or clothing worn by a person for protection from health or safety hazards associated with conditions at a work site (e.g. gloves, safety glasses, fall protection, etc.). PPE is used when engineering or administrative methods cannot fully control the hazards.
SCBA	means Self Contained Breathing Apparatus. An atmosphere – supplying respirator for which the breathing air source is designed to be carried by the user.
SABA	means Supplied Air Breathing Apparatus. An atmospheric – supplying device which provides the wearer with respirable air from a source outside the contaminated area.
Supervisor	means an individual that directs or oversees a person, group, department, organization, or operation for the University of Calgary i.e. Principal Investigator
Worker	means a person engaged in an occupation. <i>Alberta OHS Act (2009)</i>

7.0 Related Documents

- [Fall Protection Program](#)
- [Hazard Assessment and Control Form \(HACF\)](#)
- [Hearing Conservation Program](#)
- [Respiratory Protection Program](#)
- [University's Hazard Assessment and Control Procedure](#)

8.0 References and Additional Resources

- Alberta Occupational Health and Safety Act, Regulation and Code
<http://work.alberta.ca/occupational-health-safety/307.html>
- Alberta Occupational Health and Safety Code Explanation Guide
[OHS Code Explanation Guide 2009 - Alberta Human Services - Government of Alberta](#)
- University of Calgary Occupational Health and Safety Policy
<https://www.ucalgary.ca/policies/files/policies/occupational-health-and-safety-policy-editorial-changes-oct-19-2016.pdf>
- EHS Website
www.ucalgary.ca/safety

The electronic version is the official version of this standard.

- For any PPE requirements not covered within this program or any questions regarding the appropriate selection of PPE, please contact EHS.

Legislation and Standards

Part 18 of the Alberta Occupational Health and Safety (OH&S) Code outlines requirements for proper selection, use, care, and maintenance of PPE. Standards pertaining to PPE referenced in the OH&S Code include:

- CSA Standard Z94.3-07, Eye and Face Protectors.
- CSA Standard Z94.3-02, Eye and Face Protectors.
- CSA Standard Z94.3-99, Industrial Eye and Face Protectors.
- ANSI Standard Z87.1-2003, Occupational and Educational Personal Eye and Face Protection Devices.
- ANSI Standard Z87.1-1989, Practice for Occupational and Educational Eye and Face Protection.
- CSA Standard Z195-02, Protective Footwear.
- ASTM Standard F2413-05, Specification for Performance Requirements for Protective Footwear.
- NFPA Standard 1971, Protective Ensemble for Structural Fire Fighting, 2007 Edition
- NFPA Standard 1977, Protective Clothing and Equipment for Wildland Fire Fighting, 2005 Edition.
- CSA Standard CAN/CSA-Z94.1-05, Industrial Protective Headwear.
- ANSI Standard Z89.1-2003, American National Standard for Industrial Head Protection, for Type II head protection.
- BSI Standard BS 6658:05, Specification for Protective Helmets for Vehicle Users.
- CSA Standard Z180.1-00 (R2005), Compressed Breathing Air and Systems.
- CSA Standard Z94.4-11, Selection, Use and Care of Respirators.
- CGSB Standard CAN/CGSB 65.7-M88 AMEND, Lifejackets, Inherently Buoyant Type.
- CGSB Standard CAN/CGSB 65.11-M88 AMEND, Personal Flotation Device.

The electronic version is the official version of this standard.