



Protective Footwear Standard: Selection, Use, and Care

Falling or rolling objects, sharp objects, exposed energized electrical conductors, or other hazards can create a potential for foot injury. Whenever practicable, these hazards shall be eliminated or reduced through the use of proper engineering and/or administrative controls. To protect against those hazards that continue to exist after all such control measures have been implemented, appropriate protective footwear must be used. This standard is based on the Canadian Standards Association (CSA) Standard Z195.1-16, "Guideline for Selection, Care, and Use of Protective Footwear" (hereinafter referred to as "Z195.1").

SCOPE:

This standard applies to any individuals (e.g., faculty, staff, students and visitors) who may be exposed to a foot injury during University-sanctioned activities and/or on University owned and operated premises.

RESPONSIBILITIES:

Principal investigators/supervisors and all others in authority shall:

- Identify situations where foot protection is required and communicate this information to their staff/teams through written procedures and/or signage;
- Determine (using this standard or in conjunction with Environmental Health and Safety) the type of protective footwear required for the specific foot hazard;
- Provide individuals exposed to foot hazards with appropriate protective footwear (where applicable);
- Ensure that individuals are informed and provided instruction (if necessary) on the proper use, care, and maintenance of protective footwear; and
- Ensure that individuals wear appropriate protective footwear at all times in areas where foot hazards exist.

Faculty, staff, students, and visitors shall:

- Wear appropriate foot protection at all times in foot hazard areas;
- Inspect protective footwear regularly to ensure it is in good condition;
- Notify their PI/supervisor when their protective footwear is damaged and requires replacement, or if they encounter a novel or hazardous situation where different protective footwear may be required;
- Not alter or modify protective footwear; and
- Store and maintain protective footwear in good condition between use.

PROTECTIVE FOOTWEAR:

Injuries to the feet may be prevented by the use of appropriate protective footwear as part of an overall foot protection program. Appropriate protective footwear must protect against the specific hazards presented by the workplace environment and work activities, provide a comfortable and secure fit, and comply with CSA Standard Z195-14 (R2023), "Protective Footwear" (hereinafter referred to as "CSA Z195"). CSA Z195 sets out the design, performance, test methods, and marking and labelling requirements for protective footwear.

For individuals who work in laboratories, review the [University of Toronto General Laboratory PPE Assessment Tool](#) for determining protective footwear and other PPE needs.

Appendix A lists the markings found on protective footwear together with their protective features. **Appendix B** identifies the recommended footwear protection options for various workplace hazards. It also indicates the types of footwear that should not be used for certain hazardous situations.

The following section provides a description of the common types of footwear protection.

1. Protective Toecap Impact Resistance Footwear

Safety footwear that provides adequate protection against toe impact must be worn by those who are exposed to potential impact injury to the toes. CSA-certified safety footwear incorporates a permanent, integrated, non-removable toecap into the boot or shoe to provide protection against impact to the toes. There are two grades of protective toecap impact resistance footwear depending on the degree of impact protection provided:

Grade 1

- Withstands an impact of 125 joules (the equivalent of a 50-pound object dropped at a height of 22-inches).
 - With protective soles: marked with a green equilateral triangle.
 - Without protective soles: marked with a blue rectangular patch.

Grade 2

- Withstands an impact of 90 joules (the equivalent of a 50-pound object dropped at a height of 16 inches).
 - With protective soles: marked with a yellow equilateral triangle.
 - Without protective soles: marked with a grey rectangular patch.

Protective toecap impact resistance footwear must be worn where there are hazards of falling objects, rolling objects, sharp objects, hot objects, and saw cutting. This may include workplaces where heavy materials are handled, heavy equipment or machinery is used, construction sites, or machine shops.

2. Protective Sole Puncture Resistance

Safety footwear which provides adequate protection against penetration of sharp objects into the bottom of the foot must be worn by those who are exposed to potential puncture to the foot. CSA-certified safety footwear incorporates a protective non-removable plate into the sole of the boot or shoe.

Protective footwear with sole puncture resistance must be worn where there are hazards of sharp objects (such as nails, wire, tacks, scrap metal, or glass), hot objects, or saw cutting.

3. Metatarsal Protector Impact Resistance

Safety footwear that provides adequate protection against metatarsal impact must be worn by those who are exposed to potential impact injury to the metatarsal (top of foot between the toes and ankle). CSA-certified safety footwear must have a shield of sufficient width and height, attached to the shoe or boot, that provides protection against impact to the metatarsal area of the foot.

Protective footwear with metatarsal impact resistance must be worn where there are hazards of falling objects, rolling objects, sharp objects, hot objects, and saw cutting.

4. Electric Shock-Resistant Footwear

Safety footwear that provides adequate protection against electrical shock must be worn by those who may be exposed to potential live electrical conductors. CSA-certified safety footwear must have a sole and heel constructed of electrically insulating materials that provides protection against

electric shock to the bottom of the foot. Such foot protection is provided under dry conditions and the insulating properties of such footwear will deteriorate in wet environments and with wear.

Protective footwear with electric shock-resistant soles must be worn where there are hazards of electric shock but must not be used where there are static discharges or micro-circuit hazards.

5. **Static-Dissipative (SD) Footwear**

In environments where the buildup of static electricity must be minimized, workers are required to wear static dissipative footwear. Static dissipative footwear incorporates a sole designed to continuously dissipate electrostatic charges into the walking surface, thus reducing the accumulation of static electricity.

Static dissipative footwear must not be worn where there is a hazard of electric shock (such as around open electrical circuits or highly charged electrical equipment) as static dissipative footwear does not offer protection. They are also not intended to be used in environments where explosive hazards exist.

CSA Z195 defines two options for static-dissipative footwear based on different requirements for static dissipation:

Conventional static-dissipative footwear (SD): Protective footwear that falls within the electrical resistance range of $10^6 \Omega$ to $10^8 \Omega$ at an applied voltage of 500 V for a period of 5 seconds when tested in accordance with the procedure outlined in CSA Z195:14 (Clause 6.6.1.2).

Super static-dissipative footwear (SD+): Protective footwear that falls within the electrical resistance range of $10^6 \Omega$ to $3.5 \times 10^7 \Omega$ when tested in accordance with the procedure outlined in ASTM F2412.

Protective footwear with static-dissipative soles are intended for work in environments with electronic or sensitive instruments.

6. **Conductive Footwear**

In environments where there is a hazard of static ignition, conductive sole protective footwear must be worn. Conductive footwear incorporates a sole that is constructed of a conductive material designed to electrically ground the foot. They are intended for use in explosive hazard areas.

It should be noted that in addition to wearing conductive sole footwear, all containers and equipment in the area should be grounded. Conductive soles should not be worn where there is a hazard of electric shock, as they offer no protection.

7. **Chainsaw Protective Footwear**

Individuals who use chainsaws and are exposed to saw cutting hazards must wear protective footwear designed to prevent a chainsaw from cutting into the shin, ankle, foot, and toes.

8. **Slip-Resistant Footwear**

In environments where the walking surface or environmental condition poses a slipping hazard, protective footwear designed to maximize traction and reduce slippage must be worn. Some sole materials and tread designs may be better suited for specific surfaces and there is no single sole material or tread design that will be effective for all environmental conditions. The wearer should contact the supplier or manufacturer of the footwear for specific advice on appropriate slip-resistant footwear for a particular application or work environment.

In accordance with CSA Z195, footwear identified as “slip resisting” or “slip resistant” must provide the results of slip resistance testing attained from an independent third-party laboratory. Test results will be specified either on the packaging, on a label affixed to the footwear, or on the product information sheet included with the footwear.

9. Over-The-Shoe Toe Protectors

Over-the-shoe toe protectors compliant with CSA Z334-14, “Over-the-shoe toe protectors” are not considered to be protective footwear. These type of toe protectors are designed only to provide basic protection from impacts to the toes for temporary use by visitors only.

Over-the-shoe toe protectors are not intended to be used by individuals performing work in a foot hazard area and should not be used as a substitute for traditional safety footwear.

CSA-CERTIFIED PROTECTIVE FOOTWEAR:

Only footwear products that are certified by the CSA Group (conforming to CSA Z195 standard) should be purchased and used.

A protective footwear product that is certified by the CSA Group will be labelled with one or more markings indicating the type(s) of protection provided by the footwear along with the CSA logo. The markings will be sewn or attached to the outside upper or tongue of the right shoe or boot. Marking labels may be combined or the footwear may be marked with multiple labels. Refer to **Appendix A** for more information on the different protective footwear markings.

Footwear may also be labelled to indicate the level of slip resistance. The label may appear on the packaging, the footwear, or product sheet.



Figure 1. Protective footwear with Grade 1 protective toecap and puncture-resistant sole, electric shock resistance, and metatarsal protection.

PROTECTIVE FOOTWEAR IN LABORATORY/RESEARCH ENVIRONMENTS:

Appropriate protective footwear must be worn at all times in laboratory and research environments where chemicals are used and stored. Perforated shoes, sandals, and the like must not be worn in these environments. Appropriate shoes or boots must cover and protect the entire foot. Footwear materials, including soles and uppers, must be compatible with the laboratory environment, the materials handled, and the tasks conducted.

Depending on the types of hazards in the laboratory or research environment, footwear which provides additional protection may be warranted. Footwear with soles that are resistant to slip, abrasion, oils, or heat may need to be considered. Where the potential exists for foot injury due to impact, puncture, electrical shock, or static electricity, appropriate CSA-certified footwear must be worn.

PROTECTIVE FOOTWEAR IN MECHANICAL ROOMS:

Appropriate CSA-certified protective footwear must be worn at all times in mechanical rooms. Appropriate shoes or boots must cover and protect the entire foot. Footwear materials, including soles and uppers, must be compatible with the environment, the materials handled, and the tasks conducted.

Mechanical rooms with designated walking paths for visitors may be exempt from CSA-certified footwear. However, perforated shoes, sandals and the like must not be worn in mechanical rooms. Heels must not exceed 1-inch and must have at least a 1-inch square base on the heel.

PROTECTIVE FOOTWEAR SELECTION

(For Principal Investigators/Supervisors and all others in authority):

When selecting protective footwear, the PI/Supervisor should consider the following:

- Footwear must provide proper protection and durability against the type of hazard(s) presented by the work environment or work activity. Assess the workplace and work activities for:
 - Materials handled or used by the worker.
 - Objects that may fall onto or strike feet.
 - Material or equipment that might roll over feet.
 - Sharp or pointed objects that might cut the top of the feet.
 - Objects that might penetrate the bottom or side of the foot.
 - Possible explosive atmospheres, including risk of static electrical discharges.
 - Risk of damage to sensitive electronic components or equipment due to discharge of static electricity.
 - Risk of contact with energized conductors of low to moderate voltage.
 - Exposure to rotating or abrasive machinery.
 - Exposure to corrosive/irritating substances.
- Where the environment presents multiple foot hazards, footwear that provides protection in more than one category should be selected.
- Footwear sole and upper material should be appropriate for the type of walking or floor surface (e.g., loose ground, smooth surfaces, temperature, wet/oil, chemicals, etc.).

PROTECTIVE FOOTWEAR FIT

(For Faculty, staff, students, and visitors):

When selecting protective footwear, the wearer should assess for proper footwear fit by considering the following:

- Feet normally swell throughout the day. The best time for fitting new shoes or boots is midday.
- Try on various styles to determine the most comfortable fit for the feet.
- Shoe sizing varies amongst brands and styles. Select footwear by the fit, not the size marked inside.
- Right and left foot sizes may be different. Footwear should be fitted to the larger foot.
- Do not expect footwear to stretch with wear. If footwear does not fit initially, it will not fit later. Protective toe caps do not stretch.
- Ensure heel, ball of foot, and toes fit comfortably within shoe or boot. Lace-up shoes/boots fully. Ensure heel and ankle fits snug with minimum slippage.
- Walk around and flex the footwear to ensure comfortable fit.
- If using extra sock liners, arch supports, orthotics, and/or insoles, wear them when trying new footwear.

CARE, MAINTENANCE, AND DISPOSAL RECOMMENDATIONS:

Protective footwear must be properly cared for and maintained to ensure protective qualities of the footwear are not compromised. Refer to the manufacturer's instructions for proper storage, cleaning, and care of the footwear.

- Treads of the footwear should be kept clean to maximize slip resistance.
- Inspect footwear before use for damage (e.g., cracks in the soles, breaks in the upper, exposed toecaps, etc.).
- Monitor for deterioration which can compromise the safety of the footwear. Footwear will deteriorate over time even when not worn.
- If footwear has been exposed to sole penetration or severe impact, the footwear should be replaced even if there are no outward signs of damage.
- Replace worn or defective footwear. Footwear deemed unsafe should be destroyed. Do not recycle the footwear for other uses (e.g., personal use).

REFERENCES:

Canadian Centre for Occupational Health and Safety: Personal Protective Equipment – Foot Comfort and Safety at Work: https://www.ccohs.ca/oshanswers/prevention/ppe/foot_com.html






Canadian Centre for Occupational Health and Safety: Personal Protective Equipment – Safety Footwear: <https://www.ccohs.ca/oshanswers/prevention/ppe/footwear.html>

CSA Z195:14 (R2023): Protective Footwear: <https://www.csagroup.org/store/product/Z195-14/>




CSA Z195.1-16: Guideline for Selection, Care, and Use of Protective Footwear: <https://www.csagroup.org/store/product/Z94.3.1-16/>

University of Toronto: General Laboratory PPE Assessment Tool: <https://ehs.utoronto.ca/wp-content/uploads/2016/06/Laboratory-PPE-Assessment-Tool.pdf-Updated.pdf>

**APPENDIX A
PROTECTIVE FOOTWEAR MARKINGS**

Marking	Criteria	Intended Application
	<p>Green Triangle: Sole puncture protection with a Grade 1 protective toecap.</p>	<p>For heavy industrial work environments, especially that of construction, where sharp objects (such as nails) are present.</p>
	<p>Yellow Triangle: Sole puncture protection with a Grade 2 protective toecap.</p>	<p>For light industrial work environments requiring puncture protection as well as toe protection.</p>
	<p>Blue Rectangle: Grade 1 protective toecap with no puncture-resistant sole.</p>	<p>For industrial work environments not requiring puncture protection.</p>
	<p>Grey Rectangle: Grade 2 protective toecap with no puncture-resistant sole.</p>	<p>For institutional and non-industrial work environments not requiring puncture protection.</p>
	<p>White Rectangle with Orange Greek Letter Omega (Ω): Footwear with electric-shock protective soles.</p>	<p>For industrial work environments where accidental contact with live electrical conductors can occur.</p> <p>Warning: Electrical shock resistance deteriorates with wear and in a wet environment.</p>
	<p>Yellow Rectangle with Black "SD" Letter: Footwear with static-dissipative soles. Test criteria are 10⁶ ohms to 10⁸ ohms.</p>	<p>For industrial work environments where a static discharge can create a hazard for workers or equipment.</p> <p>Warning: This footwear should not be used where contact with live electrical conducts can occur.</p>
	<p>Yellow Rectangle with Black "SE+" Letter: Footwear with super-static-dissipative soles.</p> <p>This protection feature is similar to SD, except the test criteria are 10⁶ ohms to 3.5x10⁷ ohms.</p>	<p>For industrial work environments where a static discharge can create a hazard for workers or equipment.</p> <p>Designed for work environments with electronics or sensitive equipment.</p> <p>Warning: This footwear should not be used where contact with live electrical conducts can occur.</p>

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PROTECTIVE FOOTWEAR MARKINGS**

Marking	Criteria	Intended Application												
	<p>Red Rectangle with White "C" Letter: Footwear with electrically conductive soles.</p>	<p>For industrial work environments where low-power electrical changes can create a hazard for workers or equipment.</p> <p>Warning: This footwear should not be used where contact with live electrical conducts can occur.</p>												
	<p>Dark Grey Rectangle with White "M": Indicates footwear with metatarsal protection.</p> <p>Note: Toe protection is required for all metatarsal protective footwear.</p>	<p>For industrial work environments where heavy objects can hurt the metatarsal region of the foot.</p>												
	<p>White Label with Green Fir Tree: Indicates footwear that provides protection when using chainsaws.</p>	<p>For forestry workers and others exposed to hand-held chainsaws or other cutting tools.</p>												
<div data-bbox="232 968 980 1436" style="border: 1px solid black; padding: 10px;"> <p align="center">SLIP RESISTING RESULTS RESULTATS ANTI-GLISSEMENT</p> <p align="center">This footwear has been tested in accordance with the slip resisting requirements of CSA Z195. Cette chaussure a été mise à l'essai selon les exigences de CSA Z195.</p> <table border="1" data-bbox="277 1108 932 1318"> <thead> <tr> <th></th> <th>HEEL / TALON</th> <th>FLAT / PLAT</th> </tr> </thead> <tbody> <tr> <td>Dry quarry tile Tuile sèche</td> <td>0.XXX CoF</td> <td>0.XXX CoF</td> </tr> <tr> <td>Wet quarry tile Tuile mouillée</td> <td>0.XXX CoF</td> <td>0.XXX CoF</td> </tr> <tr> <td>Wet stainless steel Acier inoxydable mouillée</td> <td>0.XXX CoF</td> <td>0.XXX CoF</td> </tr> </tbody> </table> <p align="center">Seek the advice of the footwear manufacturer regarding appropriate application. Consultez les indications du fabricant pour une utilisation appropriée de cette chaussure.</p> <p align="center">Tested at XYZ LABORATORY on YYYY-MM-DD. Mise à l'essai au LABORATOIRE XYZ le YYYY-MM-DD.</p> </div>			HEEL / TALON	FLAT / PLAT	Dry quarry tile Tuile sèche	0.XXX CoF	0.XXX CoF	Wet quarry tile Tuile mouillée	0.XXX CoF	0.XXX CoF	Wet stainless steel Acier inoxydable mouillée	0.XXX CoF	0.XXX CoF	<p>Slip-Resistance: If footwear is indicated as “slip resisting” or “slip resistant”, a label indicating the results of slip resistance testing on various materials will be listed on the packing, footwear, or on the product sheet.</p> <p>Note: The coefficient of friction (CoF) is a measure of the resistance to slipping between the footwear and a particular surface type. It indicates how much traction or grip the footwear provides. Higher CoF values generally indicate better slip resistance.</p>
	HEEL / TALON	FLAT / PLAT												
Dry quarry tile Tuile sèche	0.XXX CoF	0.XXX CoF												
Wet quarry tile Tuile mouillée	0.XXX CoF	0.XXX CoF												
Wet stainless steel Acier inoxydable mouillée	0.XXX CoF	0.XXX CoF												

Reproduced from CSA Z195.14 (R2023), Figures 17 to 24.

Note: The ® symbol indicates the preferred positioning for the registered identifying logo or mark of the certifying agency (e.g., CSA).

**APPENDIX B
RECOMMENDED SAFETY FOOTWEAR PROTECTION FOR VARIOUS WORKPLACE HAZARDS**

Nature of Hazard	Hazardous activities involving but not limited to:	Protective Toe	Protective Sole	Metatarsal Protector	Electrical Insulation	Static Dissipation	Conductive Sole	Chainsaw Protection
Falling objects	<ul style="list-style-type: none"> - Construction sites - Handling heavy materials, heavy equipment or machinery - Handling large, heavy animals - Metal machining shops - Woodworking shops 	✓✓		✓✓				
Rolling objects	<ul style="list-style-type: none"> - Construction sites - Handling heavy materials, heavy equipment or machinery - Handling large, heavy animals - Metal machining shops - Woodworking shops 	✓✓ (Select Grade 1 toe protection)		✓✓				
Sharp objects	<ul style="list-style-type: none"> - Presence of sharp objects on ground, such as nails, wire, tacks, scrap metal or glass 	✓✓	✓✓	✓✓				
Hot objects	<ul style="list-style-type: none"> - Presence of hot objects (welding) - Hot spills and flames (e.g., deep fryers, kitchen) - Contact with hot work surfaces 	✓ (Select thermal-insulating footwear)	✓ (Select thermal-insulating footwear)	✓ (Select thermal-insulating footwear)				

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Nature of Hazard	Hazardous activities involving but not limited to:	Protective Toe	Protective Sole	Metatarsal Protector	Electrical Insulation	Static Dissipation	Conductive Sole	Chainsaw Protection
Electric shock	- Presence of energized conductors of low to moderate voltage - Construction worksites				✓✓	X	X	
Static discharge	- Handling of sensitive electronic components or equipment				X	✓✓		
Static ignition	- Presence of flammable or explosive materials				X		✓✓	
Saw cutting	- Construction worksites - Woodworking shops	✓✓	✓	✓				✓✓

Legend

- ✓✓ Highly recommended
- ✓ Recommended (depending on environment and degree of hazard)
- X DO NOT USE

Note: For hazards not specifically covered in the above table, consult the footwear supplier for advice on appropriate protection.