AS/NZS 2210.1:2010

Australian/New Zealand Standard™

Safety, protective and occupational footwear

Part 1: Guide to selection, care and use

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee SF-003, Occupational Protective Footwear. It was approved on behalf of the Council of Standards Australia on 5 August 2010 and on behalf of the Council of Standards New Zealand on 13 August 2010.
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AS/NZS 2210.1:2010

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Safety, protective and occupational footwear

Part 1: Guide to selection, care and use

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PREFACE

This Standard was prepared by the Joint Australia/New Zealand Standards Committee SF-003, Protective Occupational Footwear, to supersede AS/NZS 2210.1:1994, *Occupational protective footwear*, Part 1: *Guide to selection, care and use*.

The objective of this Standard is to provide users with advice for recommended practices for the selection, care and use of safety, protective and occupational footwear for use in a wide range of environment and occupations. The objective of this revision is to incorporate changes in requirements and nomenclature of occupational footwear as described in the latest editions of the AS/NZS 2210 series.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

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Australian/New Zealand Standard
Safety, protective and occupational footwear

Part 1: Guide to selection, care and use

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out the recommended practices for the selection, care and use of safety, protective and occupational footwear. It also includes the hazards associated with the use of such footwear.

1.2 GENERAL PRINCIPLES

In general, safety, protective and occupational footwear should be worn to reduce injuries to feet resulting from—

(a) contact with falling, rolling or cutting objects;

(b) penetration through the sole or uppers;

(c) friction or pressure blistering

(d) explosions and electrical hazards;

(e) contact with chemicals, heat and molten metals; and

(f) slipping.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS/NZS
2210 Occupational protective footwear
2210.2 Part 2: Test methods (ISO 20344:2004, MOD)
2210.3 Part 3: Specification for safety footwear (ISO 20345:2004, MOD)
2210.4 Part 4: Specification for protective footwear (ISO 20346:2004, MOD)
2210.5 Part 5: Specification for occupational footwear (ISO 20347:2004, MOD)

EN
50321 Electrically insulating footwear for working on low voltage installations

ISO
17249 Safety footwear with resistance to chain saw cutting

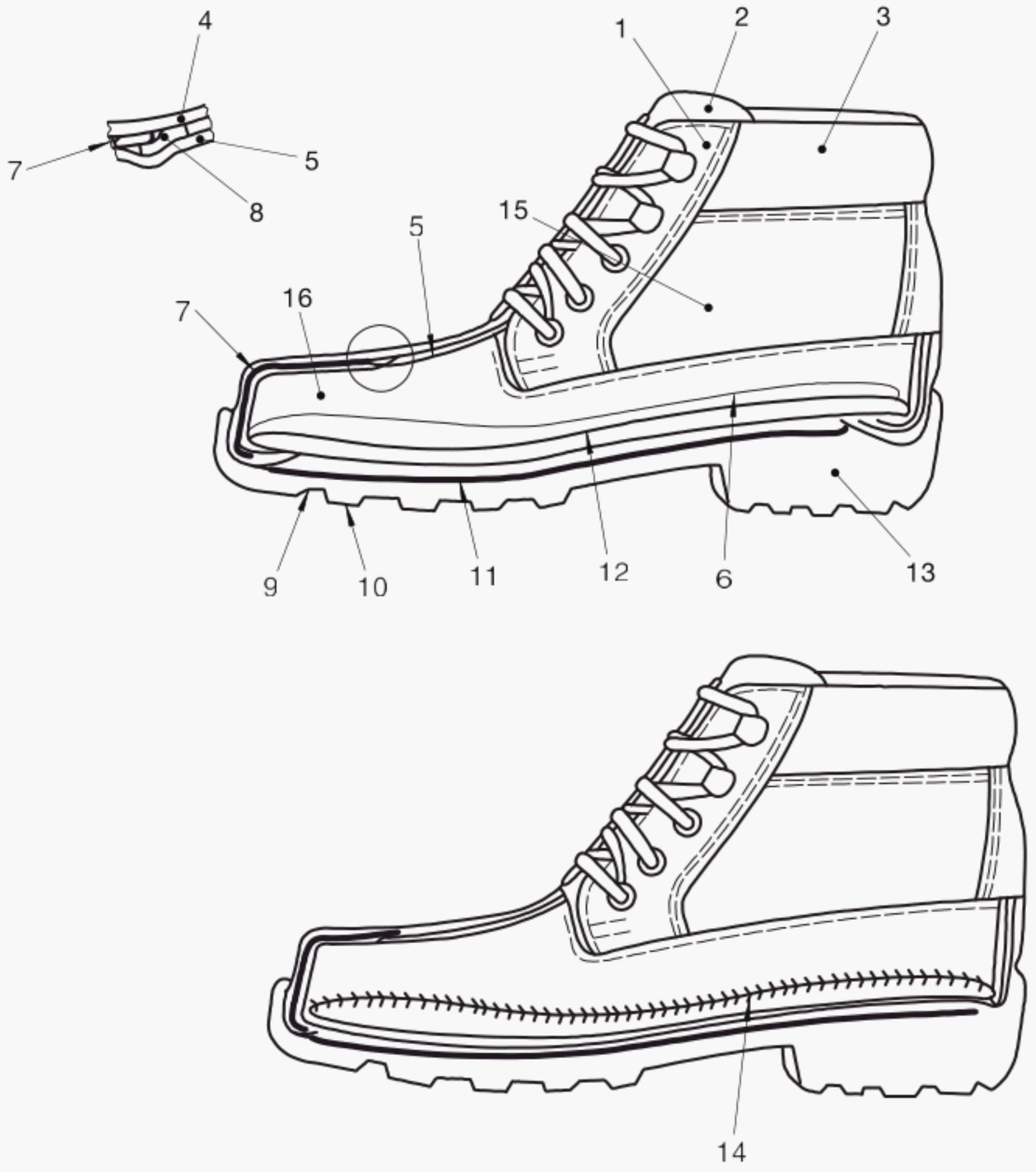
1.4 DESIGN, CONSTRUCTION AND CLASSIFICATION

Construction of safety, protective and occupational footwear is exemplified in Figure 1. Design and classification have been defined in AS/NZS 2210, Parts 2–5. Classification is presented in Table 1. Designs of footwear are illustrated in Figure 2. Protective elements should be incorporated in the footwear in such a way that they cannot be removed without damaging it.

TABLE 1.1

CLASSIFICATION OF FOOTWEAR

Code designation	Classification
I	Footwear made from leather and other materials, excluding all-rubber or all-polymeric footwear
II	All-rubber (i.e. entirely vulcanized) or all-polymeric (i.e. entirely moulded) footwear



LEGEND:

1	Facing	9	Outsole
2	Tongue	10	Cleat
3	Collar	11	Penetration-resistant insert
4	Upper	12	Insole
5	Vamp lining	13	Heel
6	Insock	14	Strobel stitching
7	Toe cap	15	Quarter
8	Foam strip	16	Vamp

FIGURE 1 EXAMPLE OF CONSTRUCTION OF SAFETY, PROTECTIVE AND OCCUPATIONAL FOOTWEAR

LEGEND:
Type A Low shoe
Type B Ankle boot
Type C Half-knee
Type D Knee-height boot
Type E Thigh boot
1 Variable extension which can be adapted to the wearer

FIGURE 2 DESIGNS OF FOOTWEAR

1.5 MARKING OF CATEGORIES

1.5.1 Safety footwear

1.5.1.1 *Basic requirements*

Safety footwear is fitted with safety toecaps and complies with the basic requirements given in Table 2 of AS/NZS 2210.3:2009. It can incorporate one or more additional protective feature(s) to protect the wearer from injuries that could arise through accidents in the working sectors for which the footwear is designed. Safety toecaps meet the requirements of impact resistance at an energy level of 200 J and the requirements of compression resistance at a compression load of 15 kN.

Marking symbol for basic requirements is SB.

1.5.1.2 *Additional requirements*

Additional protective features are presented in Table 1.2.

TABLE 1.2

ADDITIONAL MARKING SYMBOLS FOR SAFETY, PROTECTIVE AND OCCUPATIONAL FOOTWEAR

Requirement	Marking symbol on footwear
Penetration resistance	P
Electrical properties:	
Conductive footwear	C
Antistatic footwear	A
Electrically non-conductive	I
Resistance to inimical environments:	
Insulation against heat	HI
Insulation against cold	CI
Energy absorption of seat region	E
Resistance to water (footwear of Classification I)	WR
Metatarsal protection	M
Ankle protection	AN
Water penetration and water absorption of upper (footwear of Classification I)	WRU
Cut resistance	CR
Cleated outsole:	
Resistant to hot contact of outsole	HRO
Resistance to fuel oil of outsole (occupational footwear)	FO

1.5.2 Marking of categories of safety footwear

Tables 1.3 and 1.4 categorize safety footwear with the most widely used combinations of basic and additional requirements.

TABLE 1.3

SAFETY FOOTWEAR CLASSIFICATION I (FOOTWEAR MADE FROM LEATHER)

Marking symbol	Additional requirements
SB	(No additional requirements)
S1	Closed seat region Antistatic footwear Energy absorption of seat region
S2	As S1 plus Water penetration and water absorption
S3	As S2 plus Penetration resistance Cleated outsole

TABLE 1.4

SAFETY FOOTWEAR CLASSIFICATION II
(ALL-RUBBER OR ALL-POLYMERIC FOOTWEAR)

Marking symbol	Additional requirements
SB	(No additional requirements)
S4	Antistatic footwear Energy absorption of seat region
S5	As S4 plus Penetration resistance Cleated outsole

1.5.3 Protective footwear

1.5.3.1 *Basic requirements*

Protective footwear is fitted with protective toecaps and complies with the basic requirements given in Table 2 of AS/NZS 2210.4:2009. It can incorporate additional protective features to protect the wearer from injuries that could arise through accidents in the working sectors for which the footwear is designed. Protective footwear meets the requirements of impact resistance at an energy level of 100 J and the requirements of compression resistance at a compression load of 10 kN.

Marking symbol for basic requirements is PB.

1.5.3.2 *Additional requirements*

Additional protective features are presented in Table 1.2.

1.5.3.3 *Marking of categories of protective footwear*

Tables 1.5 and 1.6 categorize protective footwear with the most widely used combinations of basic and additional requirements.

TABLE 1.5

PROTECTIVE FOOTWEAR CLASSIFICATION I
(FOOTWEAR MADE FROM LEATHER)

Marking symbol	Additional requirements
PB	(No additional requirements)
P1	Closed seat region Antistatic footwear Energy absorption of seat region
P2	As P1 plus Water penetration and water absorption
P3	As P2 plus Penetration resistance Cleated outsole

TABLE 1.6

PROTECTIVE FOOTWEAR CLASSIFICATION II (ALL-RUBBER OR ALL-POLYMERIC FOOTWEAR)

Marking symbol	Additional requirements
PB	(No additional requirements)
P4	Antistatic footwear Energy absorption of seat region
P5	As P4 plus Penetration resistance Cleated outsole

1.5.4 Occupational footwear

1.5.4.1 *Basic requirements*

Occupational footwear complies with the basic requirements given in Table 2 of AS/NZS 2210.5:2009 and it should incorporate one or more protective features to protect the wearer from injuries that could arise through accidents in the working sectors for which the footwear is designed. The additional protective requirements are presented in Table 1.2.

NOTE: Occupational footwear is not fitted with safety or protective toecaps.

1.5.4.2 *Marking of categories of occupational footwear*

Tables 1.7 and 1.8 categorize protective footwear with the most widely used combinations of basic and additional requirements.

TABLE 1.7

OCCUPATIONAL FOOTWEAR CLASSIFICATION I (FOOTWEAR MADE FROM LEATHER)

Marking symbol	Additional requirements
OB	One or more of the following from Table 1.2: P, C, A, I, HI, CI, E, WR, AN
O1	Closed seat region Antistatic footwear Energy absorption of seat region
O2	As O1 plus Water penetration and water absorption
O3	As O2 plus Penetration resistance Cleated outsole

TABLE 1.8

OCCUPATIONAL FOOTWEAR CLASSIFICATION II (ALL-RUBBER OR ALL-POLYMERIC FOOTWEAR)

Marking symbol	Additional requirements
OB	One or more of the following from Table 1.2: P, C, A, I, HI, CI, E, AN
O4	Antistatic footwear Energy absorption of seat region
O5	As O4 plus Penetration resistance Cleated outsole

SECTION 2 FOOT PROTECTION

2.1 GENERAL PRINCIPLES

In order for footwear to be effectively worn, it is useful to develop an educational program to meet the needs of the user and the specific environment. Unless people are made familiar with the several factors about foot injuries and the actions necessary to prevent these injuries, they may not become sufficiently enthusiastic to ensure proper footwear is worn and other risk control measures instituted.

This should ensure the cooperation of the employees, who should be aware of their responsibility to—

(a) not willfully damage or misuse the protective footwear provided;

(b) immediately report any loss or damage affecting the footwear's performance; and

(c) understand the need for care and maintenance to actively ensure continued maximum protection of the footwear.

Information should also be provided to each wearer of protective footwear on issues such as the need to—

(i) keep feet and footwear clean;

(ii) wash and thoroughly dry feet daily; and

(iii) change socks daily.

2.2 HAZARD IDENTIFICATION AND RISK ASSESSMENT

As protective footwear can only provide the wearer with a limited degree of protection against hazards in the workplace, it is essential that a hazard analysis study be carried out before implementing a footwear protection program. An example of a hazard identification/risk assessment sheet is shown in Table 2.1.

Common workplace hazards include the following:

(a) *Slipping*—see Appendix A.

(b) *Mechanical*—falling objects, sharp or penetrating objects (puncture/penetration), moving plant, machinery/equipment cutting, crushing/compression machinery/equipment ejecting objects (metatarsal impact).

(c) *Hazardous substances*—gas, flammable materials, corrosives, toxic substances, infectious agents (chemically resistant, waterproofing).

(d) *Thermal*—extreme cold, extreme heat, splashes of hot or cold materials;

(e) *Electrical*—unsafe electrical equipment, e.g. worn cords, water near electrical equipment (electrical insulation).

(f) *Static electricity*—static discharge may cause harm to workers or equipment.

Prior to the selection of protective footwear, a hazard assessment and analysis should be conducted. This assessment is based upon the workplace environment and specific work activities.

The following potential hazard areas should be considered:

(i) Materials handled by the employee during the normal course of his/her job, in order to—

(A) evaluate the risk of objects falling onto or striking employees' feet;

(B) consider any material or equipment that might roll over employees' feet; and

(C) consider any sharp or pointed objects that might cut the top of employees' feet.

(ii) Foreign objects that may penetrate the bottom or side of the foot.

(iii) Exposure to corrosive or irritating substances.

(iv) Exposure to explosive atmosphere: evaluate the risk of static electrical discharges igniting an explosion of fire.

(v) Risk of damage to sensitive electronic components or equipment due to the discharge of static electricity.

NOTE: Check with protective footwear suppliers or manufacturers regarding the level of electrical resistance provided by the footwear.

(vi) Risk of coming into contact with energized conductors.

(vii) Risk to ankles from uneven walking surface or rough terrain (in which case ankle support is required).

2.3 SELECTION OF FOOTWEAR

The environment in which the footwear is intended to be used should be considered carefully. After a hazard identification as in Table 2.1, consideration should be given to the types of footwear available, to select the combination of footwear type, sole material, tread design and upper design and materials best suited to the application in question—see Table 2.2.

Some specific workplace hazards may fall outside the scope of a product specification. It should be noted that new materials and new technology being incorporated into footwear e.g. non-metallic toecaps or midsole protection, may perform differently to traditional materials and this may need to be taken into account when considering footwear.

Where slippery surfaces are a commonly encountered hazard, see Appendix A. Some working environments, e.g. forestry work or mining, may require special purpose footwear which may incorporate features (such as cleats or spikes) or be waterproof.

If there is doubt concerning the selection of suitable protective footwear, advice should be sought from a competent person, the footwear supplier or manufacturer.

2.4 ONGOING MONITORING

Hazard identification and risk assessment should be an on-going activity in the employer's safety program. This will ensure that risks are constantly re-evaluated and that the level of protection is maintained. Assessment should be documented and filed for easy reference.

The effectiveness of the foot protection against the hazards encountered in the workplace should be continually monitored, as the hazards may change over time. In addition, the needs of individual workers may change and the working environment may present challenges according to the season or activity.

One way of monitoring effectiveness is to assess incidents involving workers' feet. The limits of protection observed and the types of injuries sustained may provide very good feedback on the appropriateness of past footwear choices and the accuracy of the hazard analysis.

TABLE 2.1

EXAMPLE OF A HAZARD IDENTIFICATION AND ASSESSMENT WORKSHEET

Company name: ..... Date: .....

Location: ..... Name of assessor: .....

Type of facility: ....

Department area	Toe impact	Metatarsal impact	Puncture/ penetration	Chainsaw cutting	Electric shock	Electrical conduction	Static dissipation	Slip	Recommendations

NOTE: This worksheet is provided only as an example. You may wish to reduce or expand the hazard categories according to the conditions in your own workplace.

TABLE 2.2

SOME CONSIDERATIONS FOR THE SELECTION OF FOOTWEAR

Hazard	Risk	Minimum design type requirements	AS/NZS 2210 type (depending on type of risk):	Marking on footwear (one of the following):
Objects falling on or striking feet	Injury to toes	Toe protection	AS/NZS 2210.3 Class I or II	SB, S1, S2, S3, S4, S5
			AS/NZS 2210.4 Class I or II	PB, P1, P2, P3. P4, P5
Sharp materials underfoot	May penetrate the bottom or side of the foot	Penetration resistant midsole	AS/NZS 2210.3 Class I or II	P, S3, S5
			AS/NZS 2210.4 Class I or II	P, P3, P5
			AS/NZS 2210.5 Class I or II	P, O3, O5
Exposure to wet areas	Exposure to water that may penetrate the footwear causing damage to the foot and footwear	Water resistant material	AS/NZS 2210.3 Class I or II	WR, WRU, S2, S3, S4, S5
			AS/NZS 2210.4 Class I or II	WR, WRU, P2, P3, P4, P5
			AS/NZS 2210.5 Class I or II	WR, WRU, O2, O3, O4, O5
Exposure to slippery conditions—tiled surface	Falling, tripping or slipping	Slip- resistant sole	AS/NZS 2210.3 Class I or II	SRA
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	
Exposure to slippery conditions—steel	Falling, tripping or slipping	Slip- resistant sole	AS/NZS 2210.3 Class I or II	SRB
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	
Exposure to slippery conditions—steel and tiled surfaces	Falling, tripping or slipping	Slip- resistant sole	AS/NZS 2210.3 Class I or II	SRC
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	
Exposure to corrosive or irritating substances	Exposure to liquids/chemicals that may penetrate the footwear causing damage to the foot and footwear	Chemical resistant	AS/NZS 2210.3 Class I or II	(No specific marking. Refer to manufacturer or supplier)
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	

(continued)

TABLE 2.2 (*continued*)

Hazard	Risk	Minimum design type requirements	AS/NZS 2210 type (depending on type of risk):	Marking on footwear (one of the following):
High temperature surfaces	Injury to foot when walking on hot surfaces, above 300°C	Heat resistant sole	AS/NZS 2210.3 Class I or II	HRO
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	
High temperatures	Foot injury due to exposure to extreme hot environments	Insulate the foot from heat	AS/NZS 2210.3 Class I or II	HI
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	
Low temperature (below –10 °C)	Foot injury due to exposure to extreme cold environments	Insulate the foot from cold	AS/NZS 2210.3 Class I or II	CI
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	
Exposure to fuel oil	Exposure to fuel oil that may penetrate the footwear causing damage to the foot and footwear	Fuel oil resistant	AS/NZS 2210.3 Class I or II	
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	FO
Heel shock	Energy absorption of the seat region	Energy absorbing seat region	AS/NZS 2210.3 Class I or II	E, S1, S2, S3, S4, S5
			AS/NZS 2210.4 Class I or II	E, P1, P2, P3, P4, P5
			AS/NZS 2210.5 Class I or II	E, O1, O2, O3, O4, O5
Ladder climbing	Foot slippage off ladder	Defined heel (i.e. not wedge heel)	Any. No heel requirements specified	Not applicable
Static electrical discharges may ignite and explosion or fire, e.g. when handling explosives	Damage to sensitive electronic components or equipment due to the discharge of static electricity	Electrically conducting. i.e. dissipating static charge in shortest possible time	AS/NZS 2210.3 Class I or II	C
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	

(continued)

TABLE 2.2 (*continued*)

Hazard	Risk	Minimum design type requirements	AS/NZS 2210 type (depending on type of risk):	Marking on footwear (one of the following):
Static electrical discharges may ignite and explosion or fire	Damage to sensitive electronic components or equipment due to the discharge of static electricity	Antistatic i.e. dissipating static charge in shortest possible time	AS/NZS 2210.3 Class I or II	A, S1, S2, S3, S4, S5
			AS/NZS 2210.4 Class I or II	A, P1, P2, P3, P4, P5
			AS/NZS 2210.5 Class I or II	A, O1, O2, O3, O4, O5
Electrical hazards	Coming into contact with energized conductors of low voltage	Electrically non-conducting (known as electrically insulating)	AS/NZS 2210.3 Class II only	I; and Class '0'
			AS/NZS 2210.4 Class II only	
			AS/NZS 2210.5 Class II only	
Uneven walking where ankle support is required	Uneven walking surface where ankle support is required	Ankle support	AS/NZS 2210.3 Class I or II	AN
			AS/NZS 2210.4 Class I or II	
			AS/NZS 2210.5 Class I or II	
Exposure to rotating or abrasive machinery (e.g. angle grinders)	Cuts to the foot	Metatarsal and toe protection	AS/NZS 2210.3 Class I or II	M
			AS/NZS 2210.4 Class I or II	
Exposure to rotating or abrasive machinery (e.g. chainsaws)	Cuts to the foot	Chainsaw resistant materials	ISO 17249	
Objects rolling or falling onto foot	Damage to instep	Metatarsal protection and toe protection	AS/NZS 2210.3 Class I or II	M
			AS/NZS 2210.4 Class I or II	

SECTION 3 ADDITIONAL REQUIREMENTS FOR SAFETY FOOTWEAR

3.1 GENERAL

This Section provides guidance on additional protective features that may be needed for safety footwear.

3.2 PENETRATION RESISTANCE

Penetration resistant midsoles should be used where foot injuries due to penetration through the sole are likely. Such midsoles, when complying with AS/NZS 2210.3, are integral with the construction of the footwear, i.e. cannot be moved without damaging it. Footwear is marked with symbol ‘P’.

3.3 PROTECTION OF METATARSAL

Metatarsal protectors should be used where foot injuries due to impact through the top of the foot are likely. Such metatarsal protectors, when complying with AS/NZS 2210.3, are integral with the construction of the footwear, i.e. cannot be removed without damaging it. Footwear is marked with symbol ‘M’.

3.4 ELECTRICAL HAZARDS

3.4.1 Electrically conductive properties

Electrically conductive footwear should be used if necessary to minimize electrostatic charges in the shortest possible time, e.g. when handling explosives. Electrically conductive footwear should not be used if the risk of shock from any electrical apparatus or live parts has not been completely eliminated. In order to ensure that this footwear is conductive, it has been specified to have an upper limit of resistance of 100 kΩ in its new state.

During service, the electrical resistance of footwear (boots and shoes) made from conductive material can change significantly, due to flexing and contamination, and it is necessary to ensure that the product is capable of fulfilling its designed function of dissipating electrostatic charges during the whole of its life. Where necessary, the user is therefore recommended to establish an in-house test for electrical resistance and use it at regular intervals.

The test and those mentioned below should be a routine part of the accident prevention program at the workplace. If the footwear is worn in conditions where the soling material becomes contaminated with substances that can increase the electrical resistance of the footwear, wearers should always check the electrical properties of their footwear prior to entering hazardous areas.

Where conductive footwear is in use, the resistance of the flooring should be such that it does not invalidate the protection against the static electricity provided by the footwear.

In use, no insulating elements should be introduced between the inner sole of the footwear and the foot of the wearer. If any insert is put between the inner sole and the foot, combination footwear/insert should be checked for its electrical properties. Footwear is marked with symbol ‘C’.

3.4.2 Antistatic properties

Antistatic footwear should be used if it is necessary to minimize electrostatic build-up by dissipating electrostatic charges, thus avoiding the risk of spark ignition of, for example flammable substances and vapours, and if the risk of electric shock from any electrical apparatus or live parts has not been completely eliminated. However it should be noted that antistatic footwear cannot guarantee adequate protection against electric shock as it introduces only a resistance between foot and floor. If the risk of electric shock has not been completely eliminated additional measures to avoid this risk are essential. Such measures, as well as the additional tests mentioned below, should be a routine part of the accident prevention program at the workplace.

Experience has shown that, for antistatic purposes, the discharge path through a product should have an electrical resistance of less than 1000 MΩ at any time throughout its useful life. A value of 100 kΩ is specified as the lowest limit of resistance of a product when new, in order to ensure some limited protection against dangerous electrical shock or ignition in the event of any electrical apparatus becoming defective when operating at voltages of up to 250 V. However, under certain conditions, users should be aware that the footwear might give inadequate protection and additional provisions to protect the wearer, should be taken at all times.

The electrical resistance of this type of footwear can be changed significantly by flexing, contamination or moisture. This footwear will not perform its intended function if worn in wet conditions.

It is, therefore necessary to ensure that the product is capable of fulfilling its designed function of dissipating electrostatic charges and also of giving some protection during the whole of its life. The user is recommended to establish an in-house test for electrical resistance and use it at regular and frequent intervals.

Classification I footwear can absorb moisture if worn for prolonged periods and in moist and wet conditions can become conductive.

If the footwear is worn in conditions where the soling material becomes contaminated, wearers should always check the electrical properties of the footwear before entering a hazard area.

Where antistatic footwear is in use, the resistance of the flooring should be such that it does not invalidate the protection provided by the footwear.

In use, no insulating elements, with the exception of normal hose, should be introduced between the inner sole of the footwear and the foot of the wearer. If any insert is put between the inner sole and the foot, the combination footwear/insert should be checked for its electrical properties.

3.4.3 Electrically non-conductive footwear

Although the term ‘electrically insulating footwear’ is used in EN 50321, footwear meeting these requirements in Australia and New Zealand is generally known as ‘electrically non-conductive footwear’, as insulation cannot be guaranteed.

Non-conductive footwear may be used to provide additional insulative protection when working in areas of exposed live low voltage (50 V a.c. to 1000 V a.c.) conductors or where contact with damaged live low voltage equipment or conductors is likely. It should be considered as only part of the overall strategy when entering such hazardous areas.

Non-conductive footwear is required to be tested and comply with Class ‘0’ footwear of EN 50321:1999, Part 6.3. This is marked with the symbol ‘I’. See Table 2.2.

Footwear with non-conductive properties may provide limited insulation to the electrical path of low voltage currents passing through the body. Where other parts of the body are in contact with the earth or other phases, the protection provided by non-conductive footwear will be negated.

Non-conductive footwear has not been tested to withstand electric fault current arc.

Non-conductive footwear will not provide 100% protection from the hazards of electric shock in all working conditions.

Non-conductive footwear must not be used as a primary insulation against the hazards of electric shock. Persons exposed to live low voltage risk need to have additional measures in place to prevent electric shock.

The insulative properties of non-conductive footwear will be reduced or negated by:

(a) *Physical damage* Including but not limited to, nicks, cuts, puncture or embedding of conductive materials, abrasion, also including external exposure of any portion of a metallic protective toe cap.

(b) *Chemical damage* Any exposure to chemicals, including water, which may permanently or temporarily change the dielectric strength of the footwear materials. Classification I footwear can absorb moisture if worn for prolonged periods and in moist or wet conditions.

Daily, prior to use, the user should conduct a thorough examination of the footwear for any evidence of physical damage or chemical contamination. Any footwear showing evidence of damage or contamination likely to reduce or negate the insulative properties should be not used within a low voltage hazardous area.

If doubt exists concerning the suitability of individual footwear, additional advice should be sought from the manufacturer or the footwear supplier, and from electrical industry safety practitioners.

SECTION 4 FITTING AND CARE OF FOOTWEAR

4.1 FITTING

4.1.1 General

The fitting of safety protective or occupational protective footwear is an important part of the foot protection program. Persons are far more likely to adopt a responsible attitude towards the protection of their feet if the fitting consultant is clearly concerned with ensuring the fitting procedure is careful and thorough so the best possible fit is obtained.

4.1.2 Benefits

The fitting of footwear has two important benefits—

(a) it contributes to the maintenance of foot health; and

(b) it helps to prolong the life of footwear.

It is recommended that the fitter be well trained and practiced in the fitting of footwear. In the absence of a qualified fitter emphasis on fitting should be placed on fitting footwear with adequate length and width.

4.1.3 Other considerations

If using extra sock liners, arch supports, orthotics, and/or insoles, it is essential to wear them when selecting new footwear. If any inserted insole is added to the footwear and extended under the protective toecap, it may adversely affect the protector, causing it to no longer meet impact criteria.

Before adding sock liners, arch supports, orthotics, and/or insoles to the footwear, discuss the potential addition with an appropriate medical practitioner to ensure that it is required and/or that the proper insert is applied. The supplier providing the footwear should be advised of any inserts to ensure the proper fitting of footwear.

WARNING: IF INSERTS ARE ADDED AFTER THE PURCHASE OF THE PROTECTIVE FOOTWEAR, THEY COULD REDUCE OR ELIMINATE THE EFFECTIVENESS OF THE FOOTWEAR.

4.2 CARE

4.2.1 Cleaning

It is recommended that protective footwear be cleaned regularly.

In general, leather uppers should be polished or treated with leather preservative, rubber and synthetic-coated leather uppers should be washed and dried, suede uppers should be cleaned using a dry brush. Soles should be cleaned by brushing and washing to remove contaminants.

Footwear should not be cleaned with solvents.

Refer to the manufacturer's instructions for proper cleaning and care of the footwear.

4.2.2 Storage

Footwear should be stored in a cool, dry place away from direct sunlight.

Footwear should not be force dried.

The use of some soling materials such as polyurethane may introduce the risk of hydrolysis, (the ingression of water from humid environments) which leads to degradation of the material in storage. Whilst such footwear may meet the requirements of laboratory tests, to prolong life, it is especially important to dry by wiping after use, and to store in dry well-ventilated conditions. Footwear should be inspected prior to use as damage due to hydrolysis may occur during storage.

Refer to the manufacturer's instructions for proper storage.

4.2.3 Alterations

Any unauthorized alterations to footwear, e.g. mechanical stretching, or adding vent holes, should not be made, as such alterations may—

(a) take the footwear out of compliance with the relevant Part of AS/NZS 2210;

(b) void any approval or certification of the footwear; and

(c) reduce the effectiveness of the footwear.

4.2.4 Maintenance

All footwear should be examined for external damage prior to use and after each use. If there are any cracks, breaks in the leather, exposed toecaps or similar damage that reduces the protective qualities of the footwear, the footwear should be replaced. See Appendix B for guidance to user on assessing wear.

When protective footwear in the workplace is replaced, it is because the original footwear is no longer considered appropriate for use. All used footwear which is considered unsafe should be destroyed. It should not be recycled for home use where a danger to feet (e.g. a lawnmower) is present.

4.3 HYGIENE

Information should be provided to each wearer of protective footwear regarding the need to—

(a) keep feet and footwear clean;

(b) wash and thoroughly dry feet daily; and

(c) change socks daily.

APPENDIX A

SELECTION GUIDE BASED ON THE SLIP-RESISTANCE CHARACTERISTICS OF SOLING MATERIALS

(Informative)

A1 GENERAL

It is impossible to make specific recommendations as to what soling material or design is effective for all walking and flooring conditions. A soling material effective for one type of walking surface material may not always be effective because of the different factors in the work environment.

Slip resistance is a safety feature available for all footwear (Classification I or II). Footwear should be slip-resistance especially when walking on surfaces contaminated by, for example, oil, detergent or water. Cleated outsoles can decrease slipping outdoors on rough surfaces. Footwear for outdoor use in cold environment (snow, ice) should be slip-resistant on icy surfaces. Slipping on icy surfaces can be prevented by using anti-slip-devices, e.g. crampons or spikes. Although slip-resistant footwear cannot completely prevent slipping, it can reduce the risk. Special purpose footwear may be required in some work environments, e.g. logging or mining, sand or sludge. This may incorporate features such as cleats or spikes.

A2 SOLE DESIGN FACTORS

Aside from the basic sole material, aspects of sole design that affect slip resistance include the following:

(a) The shape of the sole.

(b) Tread design.

(c) The shape of the heel.

(d) The softness/hardness of the sole.

Treads in the sole allow liquid on the walking surface to be dispersed so that the sole can make contact with the underlying surface material. The shape of the heel may be bevelled so that on initial contact a greater heel surface area contacts the ground; this may minimize the chances of slipping. In some instances, soft soling materials may provide better slip resistance.

A3 WORK ENVIRONMENT FACTORS

Consider the following work environment factors that may affect slip resistance:

(a) Type of surface material.

(b) Smoothness of walking surface.

(c) Whether it is a dry or wet surface.

(d) The type of liquid on a wet surface.

(e) The temperature of the surface.

(f) The temperature of the air.

NOTE: Some soles may have markedly different slip characteristics at sub-zero temperatures.

In general, smooth and/or wet surfaces are more slippery. Be aware also that cold temperatures can affect the soiling materials by making it harder and less slip-resistant.

CAUTION: SAFETY FOOTWEAR IS ONLY A SECONDARY LINE OF DEFENCE.
CONTROL FOOT HAZARDS AT THEIR SOURCE AND WORK SAFELY.

APPENDIX B

ASSESSMENT OF FOOTWEAR

(Informative)

The following list and figures are provided to assist users in assessing the state of worn footwear.

Footwear should be checked for any signs of damage and discarded if any of the following are found:

(a) Beginning of pronounced and deep cracking affecting half of the upper material (Figure B1 (a)).

(b) Strong abrasion of the upper material, especially if the toe-cap is revealed (Figure B1(b)).

(c) The upper showing areas with deformations, burns, fusion or bubbles, or split seams in the leg (Figure B1(c)).

(d) The outsole shows cracks greater than 10 mm long and 3 mm deep (Figure B1(d)).

(e) Upper/sole separation of more than 10–15 mm long and 5 mm wide (deep).

(f) Cleat height in the flexing area lower than 1.5 mm (Figure B1(e)).

(g) Original insock (in any) showing pronounced deformation and crushing (Figure B1(f)).

NOTE: Can be checked by inserting arm into boot.

(h) The fastening system is not in good working order (e.g. zip, laces, eyelets, touch and close system).

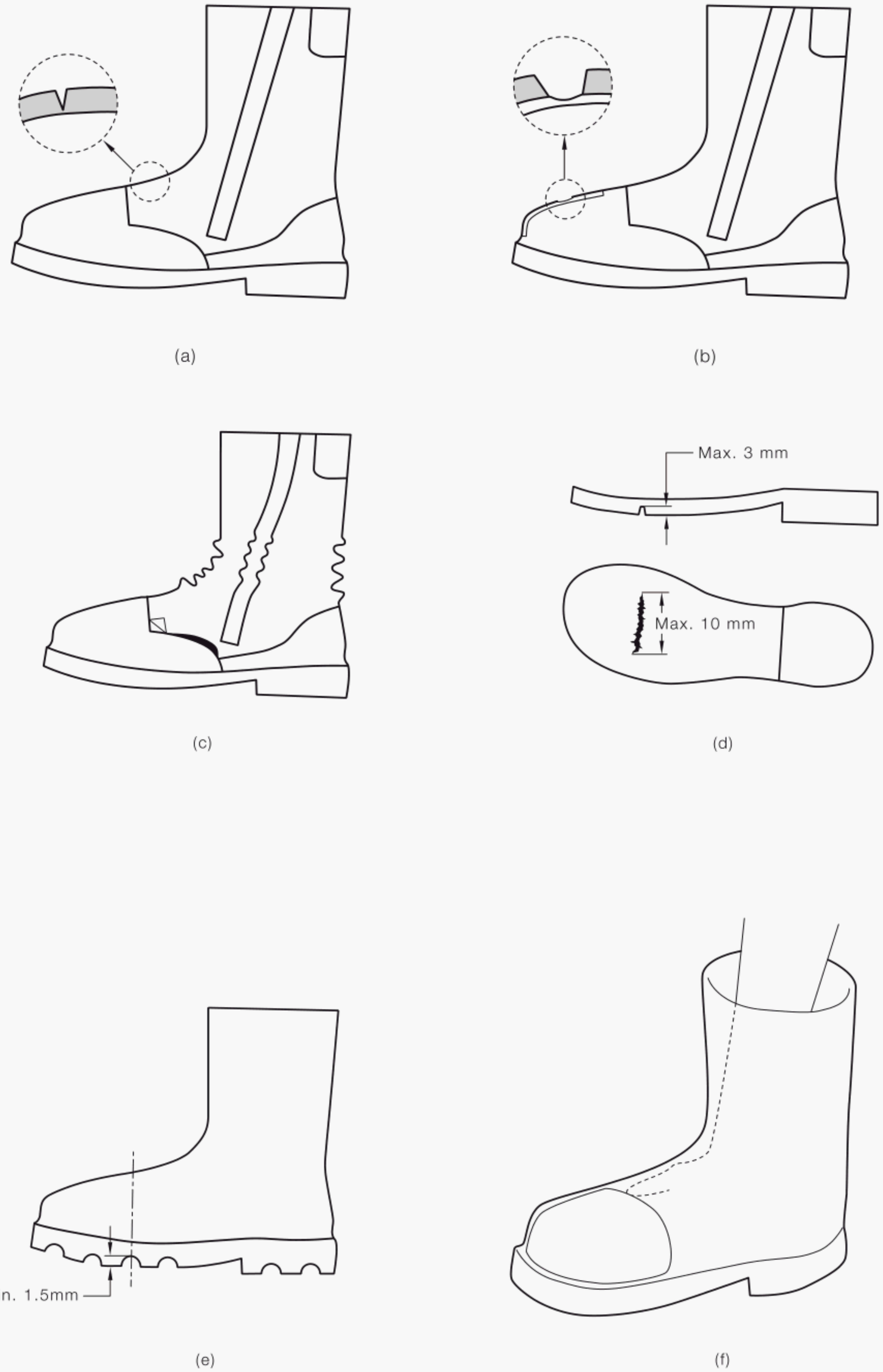


FIGURE B1 ASSESSMENT CRITERIA

Standards Australia

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Standards Australia and Standards New Zealand are responsible for ensuring that the Australian and New Zealand viewpoints are considered in the formulation of international Standards and that the latest international experience is incorporated in national and Joint Standards. This role is vital in assisting local industry to compete in international markets. Both organizations are the national members of ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission).

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