

# STANDARDS EXPLAINED

Specification for safety footwear for professional use: Footwear with characteristics suitable for protecting the wearer against injuries that may occur in the professional sectors for which the footwear has been designed, with toe caps for providing protection against impact, when tested tested at an energy level of 200 J.

## Safety Ratings Explained

Class	Features & Benefits
S0	Safety basic, 200 joules Toe Protection, Oil Resistant outer sole. (Minimum Requirement)
S0P	As S0 plus Mid-Sole for penetration resistance.
S1	As S0 plus Anti-Static properties and fully enclosed Energy Absorbing heel area.
S1P	As S1 plus Mid-Sole for penetration resistance.
S2	As S1 plus resistance to Water Penetration and absorption.
S3	As S2 plus Mid-Sole for penetration resistance and cleated outsole
S4	200 joules Toe Protection. All rubber or polymer construction (waterproof). Anti-Static properties, Energy Absorbing heel area.
S5	As S4 plus Mid-Sole for penetration resistance and cleated outsole.



### Marking categories of safety footwear:

Category	Basic Requirements	Additional Requirements
S0	I or II	
S1	I	Closed heel region Antistatic properties Energy absorption of heel region Resistance to fuel/oil
S2	I	As S1, plus: Water penetration and absorption
S3	I	As S2, plus: Penetration resistance Cleated outsole
S4	II	Closed heel region Antistatic properties Energy absorption of heel region Resistance to fuel/oil
S5	II	As S4, plus: Penetration resistance Cleated outsole

## DESCRIPTIONS

### Toe protection (SB)

Your toes are a very vulnerable part of your body, especially in a workplace. Toe protection must withstand a 200 joule impact. Joule is the unit of energy and this standard is purposefully specific. Something heavy falling from a low height could have a lot less energy than something lighter from a much higher height. As well as impacts, the toe area must withstand a resting mass of well over 1000kg. Most people have heard of steel toe cap boots but the protection doesn't have to be steel. In fact there are advantages to alternatives. Non-metallic protection can be equally as strong but lighter.

### Anti-static protection (A)

Clothing, seating materials, and climate factors can cause a build up a static charge of electricity in the body. Some materials in footwear can over insulate the body causing the charge to be held. When you then touch something the charge can rush from your body quickly causing a spark and a small uncomfortable shock. Anti-static footwear will significantly reduce this effect but does not offer full protection for exposure to electronics and explosives work. You will need Electro-Static Protection (ESD) for this.

### Mid-sole penetration protection (P) – SB-P, S1-P, S3, S5

Sharp objects where we walk and stand are a significant risk not only in the workplace but also outdoors and at home. Mid-sole protection will guard against nails and other objects. To meet this standard the footwear must be able to resist a penetration force of 1100N. Mid-sole protection is provided in one of these methods: a stainless steel insert in the sole, aluminum insert in the sole, or by Kevlar insole. The Aluminum and Kevlar solutions are the most flexible and lightest and cover the greatest area of the foot. Kevlar insoles also offer much higher thermal insulation.

### Energy Absorption (E)

Energy Absorption in the heel region

### Water Resistant Upper (WRU)

Water resistant upper; not used on all rubber or polymeric footwear

### Heat Resistant (HRO)

Heat resistant out-sole: to resist 300°C for 60 seconds

### Insulation against Cold (CI)

Insulation against cold: tested for 30 minutes at 1-20°C

### Insulation against heat (HI)

Insulation against heat: tested for 30 minutes at 150°C

### Electro-Static Discharge (ESD)

ESD footwear is designed for the electronics and explosives industry and has to meet ESD CEI BS EN 61340-5-1 standard.

### Non-metallic footwear

Safety footwear containing no metal parts is ideal for workplaces with metal detectors like airports or security points without the need to remove footwear to pass through.

All safety footwear can have more features than are listed above but these are the minimum requirements to meet each of the safety ratings and the most common.

Options for specific protection are categorised as:

A – Anti-static: Comes as standard with level S1, S2 & S3

E – Energy absorbing heel: Comes as standard with level S1, S2 & S3

P – Puncture Resistant: Comes as standard with level SB-P, S1-P & S3

HRO – Heat Resistant Out-sole: Comes as standard with level SB, S1, S2 & S3

**Requirements for footwear resistant to slip:**

Marking of product for slip resistance properties	Symbol
Ceramic tile with sandium in uryl soleplate	SRA
Steel with glycerol	SRA
Ceramic tile with sandium in uryl soleplate & steel with glycerol	SRC

**Additional requirements for special applications with appropriate symbol for marking:**

Requirement		Symbol
<b>Whole Footwear</b>	Penetration resistance	P
	Electrical properties:	C
	• Conductive footwear	A
	• Antistatic footwear	As per double triangle in standard EN 50321
	• Electrically insulating footwear	
	Resistance to inimical environments:	
	• Heat insulation of sole complex	HI
	• Cold insulation of sole complex	CI
	Energy absorption of seat region	E
	Water resistance	WR
Metatarsal protection	M	
Ankle protection	AN	
Cut resistance	CR	
<b>Upper</b>	Water penetration and absorption	WRU
<b>Outsole</b>	Resistance to hot contact	HRO
	Resistance to fuel oil	FO



ANTI  
STATIC



RESISTANCE  
TO PERF



IMPACT  
RESISTANCE



WATER  
REPELLENT



SLIP  
RESISTANCE



OIL  
RESISTANCE



ENERGY  
ABSORPTION



DUAL  
DENSITY SOLE