



RS safety footwear

Data Sheet



A range of Safety Footwear, supplied to **RS** Components by Totectors, complying with the European Standards and the British Standards for both men's and women's safety and protective footwear. The new European Standards replace the British Standards for Men's Safety Footwear BS 1870: Part 1: 1988 and the British Standards for Women's Safety Footwear BS 4972.

European standards

EN 345-200 Joules

Specification for **Safety Footwear** For Professional Use

EN 346-100 Joules

Specification for Protective Footwear For Professional Use.

Note: The new European Standards do not distinguish between men's and women's footwear and are categorised according to the toe cap protection, eg. 200 Joules Protection EN 345, 100 Joules Protection EN 346.

All footwear has been tested to relevant European and British Standards by SATRA Footwear Technology Centre (The Shoe and Allied Trade Research Association). SATRA is a NAMAS Accredited Laboratory.

European legislation

On the 1st January 1993 new regulations for Personal Protective Equipment were introduced as part of a wide range of legislation to harmonise Health and Safety Regulations throughout Europe. Safety and Protective Footwear falls under the category of Personal Protective Equipment and as such is required to conform with the relevant European Standard and hence carry the CE mark certifying compliance.

A summary of the Personal Protective Equipment at Work (PPE) Regulations 1992 is given below.

- Asses the risks and Personal Protective Equipment you intend to issue to ensure that it is suitable.
- Maintain, clean and replace PPE
- Provide storage for PPE when it is not being used
- Ensure that PPE is properly used
- Give training, information and instruction to your employees on its use and how to look after it.

To enable the user to appreciate the new rigorous standards that the footwear is tested to a brief description is given of the tests and requirements for compliance. EN 345 200 Joules (Updates BS 1870: Part 1: 1988 for men) has been used as an example as this standard is applicable to the majority of the styles. EN 346 involves similar testing procedures.

Toe cap protection

200 Joules protection

To protect the toes from serious damage it is essential that the toe cap withstands the impact test. Under the new European Standards each size of shoe has a minimum clearance it has to sustain after the test. Thus in the event of an accident and a heavy weight is dropped on the toe there will be enough room for the toes not to be damaged. The weight specified for the impact test is 20kg. The variable factor being the height from which the weight is dropped which determines the protection rating of the toe gap, eg height 1.02m. The formula for impact test is

Force (J) = weight (20kg) ³ height (variable 'M') ³ 9.81

Compression test

Under the British Standard the clearance between the underside of the toe cap and the inner sole must be 13.75mm on a size 8 shoe for a compression force of 8KN.

Under the new European Standards, the clearance varies according to the shoe size. The compression force used is also greater 15KN for Safety Footwear (200J) and 10KN for Protective Footwear (100J).

Table 1 shows the range of clearance acceptable under the new European Standards.

Table 1

Size of footwear	New EN minimum clearance	BS minimum clearance
3 and below	12.5mm	
4 and 5	13.0mm	
6	13.5mm	Size 5 10.5mm
7 and 8	14.0mm	Size 8 13.75mm
9 and 10	14.5mm	
11 and above	15.0mm	

Upper leather

Under the new European Standards there are a number of other tests that are required before the footwear is approved to the appropriate standard. Table 2 shows a list of some of the other tests that are used that do not appear under the British Standards.

Table 2

BS Requirements	EN Requirements
Substance	Tear strength
Tear strength	Tensile properties
Chromium oxide (CR203)	PH value
	Water vapour
	Permeability and coefficient
	Optional extra
	Water penetration and water absorption

Insoles

Under the new European Standards the insoles are subjected to a greater number of tests than under the British Standards the main differences are shown in table 3.

Table 3

BS Requirements	EN Requirements
Substance 2.5mm	Substance 2.0mm
	PH value
	Water absorption/description
	Abrasion resistance

Sole (abrasion resistance or wear resistance)

Wear resistance is measured by subjecting a sample of the soling material to continuous abrasion for a set period on a test rig. The less material worn away by the test the higher the resistance to wear and thus the longer the life of the sole. The table shows the different soling materials used in the **RS** Safety Footwear range and their respective resistance to wear. The lower the volume of material lost the better the performance in wear.

The **RS**/Totector range exceeds the minimum requirements under the new European Standards.

Table 4

Soiling material	BS	CEN	RS/Totector
Single density polyurethane	250mm ³	250mm ³	Less than 100mm ³
Direct vulcanised nitrile rubber	250mm ³	150mm ³	80-120mm ³
Double density polyurethane	150mm ³	150mm ³	30-90mm ³

Sole requirements are also extended under the new European Standards with extra tests carried out that were not previously tested for under British Standards.

Sole requirements

BS

1. Substance
2. Abrasion resistance

Optional

- Resistance to hot contact
- Resistance to fuel oil

EN

1. Substance
2. A cleat is only a cleat if 2.5mm or over
3. Tear strength
4. Abrasion resistance
5. Flexing resistance
6. Hydrolysis
7. Inter layer bond strength
8. Resistance to hot contact
9. Resistance to fuel oil

New European Safety and Protective Features

Under the new European Standard the footwear has been coded according to its specific feature. The system is shown below.

SB = Safety Footwear with leather uppers (Safety Basic)

PB = Protective Footwear with leather uppers (Protective Basic)

Additional features

A = Anti Static (see Code of Practice) – 100k Ω – 1000M Ω

P = Penetration Resistant Sole – 1100N Min Resistant

E = Energy Absorbing Heel – 20 Joules Min

HRO = Sole Resistant to Hot Contact – 300°C for 60s

WRU = Upper Leather Resistant to Water Penetration

– <30% Uptake at 60 minutes

<2g at 90 minutes

Water Vapour Permeability <0.8mg (cm² h)

Water Vapour Coefficient >20mg/cm²

The new codes are then assigned according to their 'grouped' features:

S1 SB + A + E

S2 SB + A + E + WRU

S3 SB + A + E + WRU + P

P1 PB + A + E

These codes will be assigned to the New European Approved Footwear from RS/Totectors.

Code of practice for users of footwear with anti-static soles which conform to DIN4843

The Anti-static Footwear has been produced with soles which conform to the anti-static requirements as specified in the German DIN Standard 4843: 1988.

Footwear with anti-static soles should be used if it is necessary to minimise electrostatic build-up by dissipating electrostatic charges, thus avoiding the risk of spark ignition if, for example, inflammable substances and vapours, and if the risk from an electric shock from any electrical apparatus has not been completely eliminated.

Experience has shown that for anti-static purposes the discharge path through a product should normally have an electrical resistance of less than 100M Ω at any time throughout its useful life. A value of 0.1M Ω is specified as the lowest limit of resistance of a product when new, in order to ensure adequate protection against dangerous electrical shock or ignition in the event of any electrical apparatus becoming defective when operating at voltages up to 250 volts. When the footwear with anti-static soles is manufactured, it has an electrical resistance of the outsole between 100k Ω and 1000M Ω , when new.

The electrical resistance of anti-static footwear can be changed significantly by flexing.

If this footwear is worn in wet conditions it will still dissipate electrostatic build-up but protection against electric shock may be reduced.

To ensure that this product is capable of fulfilling its function of dissipating electrostatic charges, and also of giving any desired protection during the whole of its life, the user is strongly recommended to carry out the test for electrical resistance at regular and frequent intervals. 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 footwear with anti-static soles is in use the resistance of the flooring should be such that it does not invalidate the protection against mains shock or 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.