



# Personal Protective Equipment Selection Guide

Select from our wide range  
of major brands

September 2018



[uk.rs-online.com](http://uk.rs-online.com)

# Personal Protective Equipment Selection Guide

## CONTENTS

### 1 GLOVES

Find the right reusable or disposable gloves to protect your workforce from injury.



Page 5

### 2 HEARING PROTECTION

Ensure you have the right hearing protection for all areas of your workplace.



Page 29

### 3 RESPIRATORY PROTECTION

Helps you select the right breathing protection for all of the applications that your workforce are exposed to.



Page 43

### 4 EYEWEAR

Choose the eyewear for the task in hand and protect your vision.



Includes key European standards to look out for.

Page 61

### 5 FOOTWEAR

Select from our wide range of footwear for a range of indoor and outdoor situations.



Page 81

### 6 HEAD PROTECTION

Protection for the most important area of the body. See our wide range of helmets and bump caps.



Page 93

### 7 FALL PROTECTION

Keep personnel safe while working at heights with our harnesses and associated fall arrest equipment.



Page 99

### 8 WORKWEAR

Choose workwear suitable for your working environment from our extensive choice in many different styles.



Page 116

### 9 DISPOSABLES

Disposable workwear for use in hazardous environments protects the wearer and avoids the need to keep it clean. Find the ideal disposable wear for your needs.



Page 153

# Reusable & Disposable Gloves

## INTRODUCTION

Welcome to our glove selection guide.

This guide helps you choose the most appropriate reusable or disposable glove to use in your workplace environment and for your application. It sets out the important points to consider when selecting a glove and provides details of the different types of glove we offer.

We include an overview of relevant safety standards that you should be aware of when choosing either reusable or disposable gloves, as well as how and where to measure to get the right fit.



### WHY BUY FROM RS?

As industry experts we offer a wide range of gloves for every requirement and environment, from professionally-approved RS products, to gloves from many of the market leading brands. This means you can find all the products you need from one source, with next day delivery, competitive pricing and bulk discounts.

## REUSABLE GLOVES

Page 8

We have divided our reusable gloves range into nine types, according to application:

### Anti-vibration

Reduces the effect of impact, shock and vibration for users of powered hand-held tools, or those needing to hold a workpiece in direct contact with machinery.

### Chemical resistant

Protects users from harmful chemical effects used in industrial and pharmaceutical applications.

### Cold resistant

Protects users from extreme cold exposure for applications such as farming, construction and machine operation.

### Cut resistant

Provides protection from sharp objects. Typically used in food and catering applications.

### Electrical safety

Protects electrical engineers from shock while working on live electrical equipment.

### General purpose

Gives the wearer protection against a variety of hazards such as cut, tear, puncture or abrasion. Used where protection from more than one hazard is needed.

### Heat resistant

Protects from extreme heat exposure. Typically used in laboratory work, construction or catering.

### Puncture resistant

Protects users from sharp objects such as glass fragments, metal shards, wood splinters, nails, wire and needles.

### Special purpose

A range of gloves to include oil repellent, flame resistant and those with special coatings for niche applications.



## DISPOSABLE GLOVES

Page 22

### Glove Material

Disposable gloves are split into categories according to their construction material:

#### Latex

Designed for comfort and dexterity.

#### Neoprene

Possess very high chemical resistance and are low in allergens.

#### Vinyl

A low cost glove with low allergens.

#### Nitrile

With high chemical resistance, high strength and puncture resistant.

#### Polyethylene

Another low cost glove with low strength.

#### Polymer

Comfortable to wear, with low allergens and moderate strength.

### Glove Type

Disposable gloves divide into three types according to their intended application.

#### Chemical resistant

Protects users from harmful chemical effects for a limited period of time for industrial applications.

#### Medical

These gloves offer the highest level of quality for higher-risk environments.

#### Minimal risk

Protects user from low-level risks for janitorial, general maintenance and light food processing tasks.



### THE IMPORTANCE OF SIZE

Choosing the correct size of glove is important. Wearing gloves that are too tight or too loose can impair the grip or create folds and be uncomfortable.

When users are issued with comfortable gloves of the correct size, they are more likely to be worn and safety is less likely to be compromised.

#### REUSABLE GLOVES

Size Range	Size (inch)	Size cm
Small	6-8	15-20
Medium	9	21-23
Large	10	24-25
Extra Large	11-12	26-30

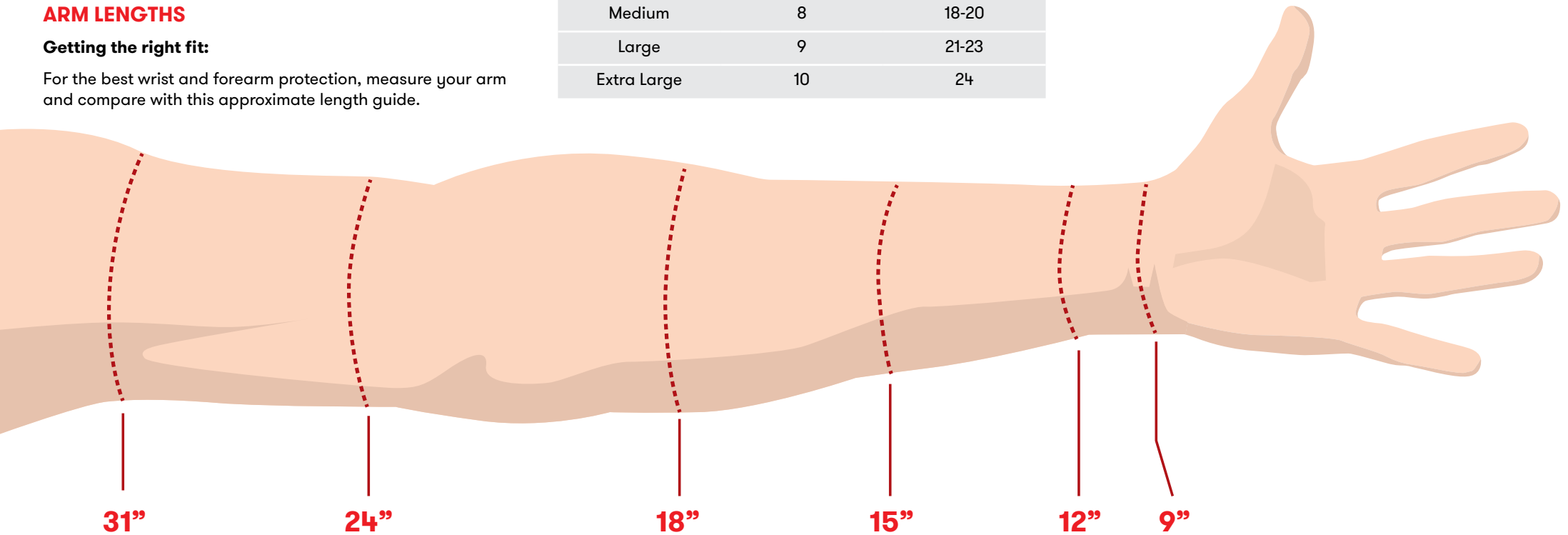
#### DISPOSABLE GLOVES

Size Range	Size (inch)	Size cm
Small	6-7	15-17
Medium	8	18-20
Large	9	21-23
Extra Large	10	24

### ARM LENGTHS

#### Getting the right fit:

For the best wrist and forearm protection, measure your arm and compare with this approximate length guide.



### REUSABLE GLOVES: SAFETY STANDARDS

Reusable gloves within the RS range are provided by a number of suppliers and manufacturers and each is designed to comply with differing protection standards. To enable easy comparison and shopping within the gloves range, RS provides details of various compliance levels and ratings within the specifications table relating to each product.

Buyers can filter the range by selecting the specific European Standard they need for each application and comparing the relevant products.

The European and US standards are still the most frequently referred to even outside these continents. There are some national standards and specifications available although these are not normally recognised outside of their regions.



### EUROPEAN STANDARDS

#### EN420 - general requirements

EN420 defines the general requirements for most types of protective gloves:

- Product and packaging information and marking
- Design and construction
- Fitness for the purpose
- Comfort and efficiency
- Innocuousness
- Storage
- Sizing

#### Electrical Safety Gauntlets

Electrical Safety Gauntlets are classed by the maximum working AC voltage that they protect against:

Class	Maximum working AC voltage
00	500V
0	1,000V
1	7,500V
2	17,000V
3	26,500V
4	36,000V

**i** The higher the 'Rating' score, the better the performance.  
0 represents a fail; X denotes no test was carried out.

#### Mechanical Hazards EN388



abcd

- a. Resistance to abrasion
- b. Blade cut resistance
- c. Tear resistance
- d. Puncture resistance

#### Rating

- 0-4
- 0-5
- 0-4
- 0-4

#### Chemical and Micro-Organism EN374



**EN374-2** Resistance to penetration by micro-organisms. Referred to as Acceptable Quality Level (AQL)

**EN374-3** Resistance to chemical hazards (permeation)

#### Rating

- 1-3
- 1-6

#### Thermal Hazards (Heat and/or Fire) EN407



abcd

- a. Burning behaviour
- b. Contact heat
- c. Convection heat
- d. Radiant heat
- e. Small splashes of molten metal
- f. Large splashes of molten metal

#### Rating

- 0-4
- 0-4
- 0-4
- 0-4
- 0-4
- 0-4

#### Protection from Cold EN511



- a. Resistance to convection cold
- b. Resistance to contact cold
- c. Permeability to water

#### Rating

- 0-4
- 0-4
- 0-1

### DISPOSABLE GLOVES: SAFETY STANDARDS

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Buyers can filter the range by selecting the specific European Standard they need for each application and comparing the relevant products.

The European and US standards are still the most frequently referred to even outside these continents. There are some national standards and specifications available although these are not normally recognised outside of their regions.

Acceptable Quality Level (AQL): this relates to the maximum number of defects you can expect per 100 gloves. For example, European Standards state that medical examination gloves shall have an AQL of 1.5. This means that it's acceptable for up to 1.5% of gloves made to contain a pinhole.



### EUROPEAN STANDARDS

#### EN420 - general requirements

EN420 defines the general requirements for most types of protective gloves:

- Product and packaging information and marking
- Comfort and efficiency
- Design and construction
- Fitness for the purpose
- Innocuousness
- Storage
- Sizing

#### EN455 - for medical use

EN455 defines the requirements and testing carried out on single-use gloves intended for medical purposes. It covers 4 key areas:

- EN455-1: Freedom from holes
- EN455-2: Physical properties
- EN455-3: Biological evaluation
- EN455-4: Shelf life determination

#### EN1149 - electrostatic properties

This is a series of standards for test methods and requirements for the electrostatic properties of protective clothing. Coverage includes:

- EN1149-1: Measure of surface resistivity
- EN1149-3: Measure of charge decay
- EN1149-5: Material and design requirements

#### Chemical and Micro-Organism EN374



**EN374-2** Resistance to penetration by micro-organisms. Referred to as Acceptable Quality Level (AQL) **Rating** 1-3

**EN374-3** Resistance to chemical hazards (permeation) **Rating** 1-6

#### Medical Devices Directives 93/42/EEC

The Medical Devices Directives classify devices according to the potential hazard, expected duration of contact and expected invasiveness. If a product conforms to the Medical Devices Directives it must carry a CE mark on its packaging and may also provide a statement of its classification. In addition, the properties of medical devices are described by a range of standards.

#### Classification of Devices

##### Class I

Non-invasive devices, for example, examination gloves (entry into a bodily orifice is not considered invasive). Class I is generally regarded as low-risk.

##### Class I - Sterile

Sterilised Class I devices, for example, sterile procedure gloves. Class I is generally regarded as low-risk.

##### Class IIa

Short-term invasive devices, for example surgical gloves. Class IIa is generally regarded as medium-risk.

**Information pertaining to a product's classification within the Medical Devices Directive can be obtained from individual product datasheets on the RS website.**

### DISPOSABLE GLOVES

#### Glove Material

Disposable gloves are split into categories according to their construction material:

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# Hearing Protection

## INTRODUCTION

Welcome to our hearing protection selection guide.

This guide sets out the importance of hearing protection in the workplace, explains why noise levels should be controlled and details when hearing protection should be issued to employees. It also includes information on the care and use of different types of hearing protection.



## PERSONAL HEARING PROTECTION

Hearing protection should be issued to employees:

- Where extra protection is needed above what has been achieved using noise control; or
- As a short-term measure while other methods of controlling noise are being developed

## WHY BUY FROM RS?

As industry experts we offer a wide range of hearing protection for every requirement and environment, from professionally-approved RS products, to those from the global market leader 3M. This means you can find all the products you need from one source, with next day delivery, competitive pricing and bulk discounts.

## WHEN IS HEARING PROTECTION REQUIRED AND WHY?

Under The Control of Noise at Work Regulations 2005 employers must provide suitable hearing protection where noise exceeds 80dB(A). In addition, note that as of 21st April 2018 PPE Directive 89/686/EEC was repealed and replaced by new Regulation (EU) 2016/425. This sees a change of classification for hearing protection equipment from product related to risk related. Companies can continue to mark hearing protection equipment to the old 89/686/EEC until April 2019.

## IMPORTANT NOTE

Hearing protection must not be used as an alternative to controlling noise. Employers are duty bound to remove or reduce risks to health and safety from noise at work.

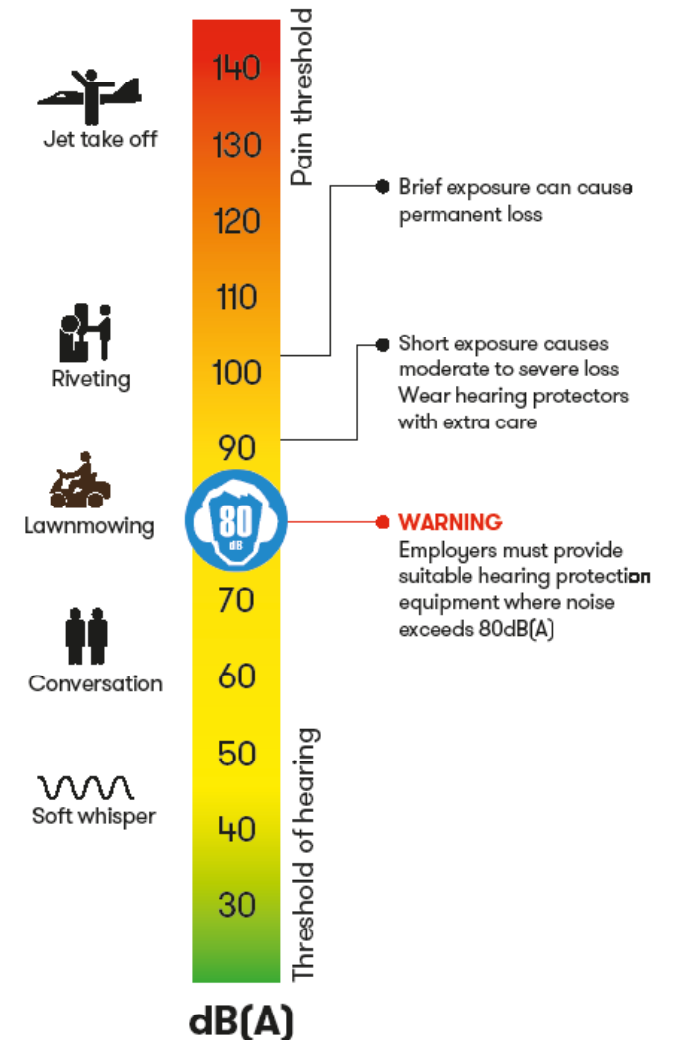
Actions and a risk assessment need to be taken if any of the following apply:

- The noise is intrusive for most of the working day - e.g. vacuum cleaner or busy road
- Voices need to be raised when having a conversation with a person 2 metres away for at least part of the day
- Working with power tools or machinery for more than half an hour a day
- Working in noisy industries, e.g. manufacturing, construction, engineering, road working, entertainment
- Impact noise, e.g. hammering or using pneumatic tools
- Noise from explosive source, e.g. detonators

**Personal hearing protection should ONLY be issued to employees once noise control measures have been taken to minimise noise such as:**

- Using quieter equipment or a quieter process
- Making technical changes to reduce noise at source
- Using screens, barriers, enclosures or absorbent materials
- Limiting employees' time spent in noisy areas

## EASY TO DAMAGE - EASY TO PROTECT



## PASSIVE HEARING PROTECTION

## Disposable Earplugs



Made from expandable, slow-recovery foam and combining comfort with protection. Once in the ear, foam plugs expand to provide a secure and snug custom fit. This type of earplug should usually be disposed of after single use and is available as individual earplugs or as a corded pair.

## BENEFITS AND APPLICATIONS

Popular due to their low-cost, ease of use and comfort. Disposable earplugs provide fast, simple protection against invasive noise in environments such as construction, metal fabrication and factory production.

## TIPS FOR USE

Slowly roll and compress foam earplugs into a very thin cylinder. While compressed, insert the earplug well into the ear canal. Fitting is easier if you reach around the head to pull the ear outward and upward during insertion.

## Reusable Earplugs



Reusable earplugs are made from flexible materials that are preformed to fit the ear. Generally available with a joining cord to prevent loss these reusable earplugs are hygienic, economical and comfortable to wear. No sizing is required. Also available in metal detectable format.

Designed for multiple use, so longer-lasting, more economical and offering higher levels of hygiene and comfort. Can be worn for longer periods.

Reach around the back of your head and pull outward on the ear while inserting the plug until you feel it sealing. This may seem tight at first, especially if you have never worn earplugs before.

## Banded Earplugs (Reusable/ Disposable)



These are easy to use, convenient and extremely comfortable to wear. Easy and quick to put on, take off or store around the neck when not required. These earplugs are ideal for intermittent use.

Ideal for environments where plugs need to be removed intermittently. Headband reduces risk of losing.

Hold the large ends of the pods and swivel them to direct the tips into the ear canal openings. Firmly push and wiggle the pods into the ear canal until a snug seal is obtained. Pulling on the outer ear while pushing the pods will be helpful to most wearers.

## Ear Defenders



Ear defenders consist of rigid cups with soft plastic cushions that seal around the ears to reduce noise. They are a popular choice in hearing protection due to their ease of use and greater levels of comfort. Available in headband, neckband, helmet-attachable and folding models to meet the needs of most applications.

Provide robust protection where higher noise levels present significant risk and require higher attenuation levels: transport, road working, airport, construction, heavy machinery.

Ear defenders must fully enclose the ears to seal against the head. Adjust the headband so cushions exert even pressure around the ears to get the best noise reduction. Pull hair back and out from beneath the cushions. Do not wear caps, store pencils behind the ear, or anything that may break the seal.

## ACTIVE HEARING PROTECTION

## Communication Ear Defenders



Two options are available: Listen Only offers the wearer the ability to press a button on the shell to reduce attenuation allowing them to hear a conversation without removing the ear defenders. Alternatively, Speak & Listen hearing protectors come with either a built-in communication radio for cable-free, short-range communication with other headsets and portable two-way radios which are programmed on the same frequency, or the input to connect a radio receiver and microphone.

## BENEFITS AND APPLICATIONS

Provide high levels of situational awareness and improved safety by allowing users to block out harmful noise whilst continuing to hear alarms and critical communications. Ideal for mining, offshore or transport industries.

## TIPS FOR USE

Without removing, simply use the button on the shell to reduce attenuation levels and hear critical instructions and signals.



## EUROPEAN STANDARDS

European standards which are relevant to the RS range of hearing protection include the following:

**EN352**

Construction, design and performance of hearing protection equipment:

- Part 1: Ear muffs
- Part 2: Ear plugs
- Part 3: Ear muffs attached to a safety helmet
- Part 4: Level dependent ear muffs
- Part 5: Active noise reduction ear muffs
- Part 6: Ear-muffs with electrical audio input
- Part 7: Level dependent ear plugs
- Part 8: Entertainment audio ear muffs

**EN13819**

Testing methods for hearing protectors:

- Part 1: Physical tests
- Part 2: Acoustic tests

**EN55013**

Radio disturbance characteristics of sound and TV broadcast receivers

**EN55020**

Electromagnetic immunity of broadcast receivers and associated equipment

**EN50581**

Assessment of electrical and electronic products with respect to the restriction of hazardous substances

**EN55022**

Radio disturbance characteristics - limits and methods of measurement

**EN55024**

Immunity characteristics - limits and methods of measurement

**EN24869**

Hearing protectors - Subjective method for the measurement of sound attenuation

**EN61000**

Electromagnetic Compatibility (EMC) - Testing and measurement techniques:

- Part 1: General
- Part 2: Environment
- Part 3: Limits
- Part 4: Testing and measurement techniques
- Part 5: Installation and mitigation guidelines
- Part 6: Generic standards

**EN300296**

EMC and radio spectrum matters - land mobile service: radio equipment using integral antennas intended primarily for analogue speech

**EN300328**

EMC and radio spectrum matters - Wideband transmission systems

**EN301489-1**

EMC and radio spectrum matters: standard for radio equipment and services; common technical requirements

**EN301489-17**

EMC standard for radio equipment: specific conditions for broadband data transmission systems

**EN60950**

Safety of information technology equipment

**EN62479**

Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10Mhz to 300Ghz)

# Respiratory Protective Equipment

## INTRODUCTION

In today's world there are multiple concerns surrounding our lungs and general respiratory health, and in a work environment it is necessary for many people to wear respirators or breathing apparatus to protect their health. In simple terms, respirators work to prevent harmful substances from in the air being inhaled. Most types of respirator work by filtering the air whilst some types provide a supply of clean air to breathe.

This simple guide has been developed to provide an overview of the key points you need to consider when selecting Respiratory Protective Equipment (RPE) and explain the differences between respirator types. It will help you to shop the RS range so you can quickly and effectively find the products and parts you need to keep your staff safe in the workplace.



## WHY BUY FROM RS?

As industry experts we offer a wide range of respiratory protective equipment for most requirements and environments, from professionally-approved RS products, to those from the global market leader 3M, so you can find all the products you need from one source, with next-day delivery, competitive-pricing and bulk discounts.

## WHEN IS RPE REQUIRED?

Some work activities can cause harmful substances to contaminate the air in a variety of forms, for example:

- **Dust** – airborne solid particles are present
- **Mists** – minute droplets are present (due to condensation or processes such as paint spraying)
- **Metal fumes** – airborne particles of metals that have vaporised and condensed (e.g. through welding processes)
- **Gases** – can be odourless and/or invisible and spread quickly
- **Vapours** – from the evaporation of solids or liquids at room temperature
- **Oxygen deficient atmospheres** – oxygen has been displaced or diluted, resulting in a risk of asphyxiation

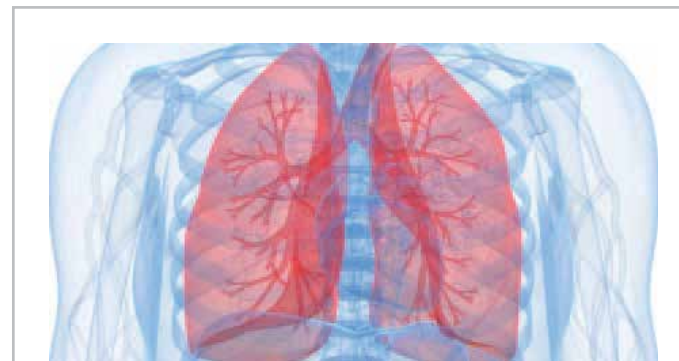
## WHY IS RPE REQUIRED?

National health and safety regulations commonly set out the requirements for minimising hazardous risks in the workplace.

RPE should ONLY be used where ALL attempts have been made to remove or reduce the levels of hazard, for example by installing extraction equipment, or by putting up physical barriers before even considering the use of RPE.

National health and safety regulations generally require that employers should:

1. Identify the hazard
2. Assess the concentration of the hazard
3. Provide only CE approved PPE/RPE
4. Establish a documented training program for all employees that are required to use RPE to ensure correct use, fitting and maintenance – which should include cleaning, replacement and storage



**“Thousands of people die from work-related lung diseases every year, in many cases due to exposures that took place many years before. Breathing in certain dusts, gases, fumes and vapours in the workplace can cause serious, long-term lung damage.”**

Health and Safety Executive (HSE)

## IMPORTANT NOTE

**Respirators MUST NEVER be used in oxygen deficient atmospheres. Specialist breathing apparatus is required that is not covered in this guide.**



## STEP-BY-STEP GUIDE TO PROVIDING PROTECTION

Selecting adequate and suitable RPE can appear daunting at first. With so many factors to consider, plus such a variety of options, it can be difficult to know where to start.

## 1 IDENTIFY THE HAZARDS

- a At a high level, there are three types of respiratory hazard:
  - Particulate Hazards:** e.g. mists, fumes, dusts or fibres
  - Gas and Vapour Hazards:** e.g. solvent vapours or acidic gases
  - Oxygen Deficient Atmospheres:** e.g. often found in confined spaces and/or where oxygen is consumed by materials or combustion
- b You need to understand the types of hazards that your workers encounter before you can make a decision on suitable RPE for the work environment.

Consider the type of work that is undertaken and identify:

- a. **Process Generated Hazards** e.g. dust from sanding wood or gases released in a reaction. Some work activities, such as heating or cutting materials, could generate harmful substances which contaminate the air in the form of mists, dusts, fumes or gases.
- b. **Bought-in Hazards** e.g. bottled gases, solvents or chemicals. Any product that is classed as 'Dangerous for Supply' will come with a Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) which should provide information on:
  - health hazards (on product labelling)
  - forms of the substances contained in the product
  - the type of RPE required for its use

## 2 ASSESS THE RISK

To ensure the RPE you select is adequate to protect your workers against any harmful substances in the air around them, you need to understand the amount in the air and the form it takes (e.g. vapour or particles), to effectively assess the concentration of the hazard.

There are various types of respirator and breathing apparatus available and the protection they offer depends on a number of things, including the protection factor. To help you, each type and class of RPE is categorised by a protection factor which takes the form of either a Nominal Protection Factor (NPF) or an Assigned Protection Factor (APF). More information on this can be found on page 46.

### Things to check:

- a. Check MSDSs of bought-in hazards – do they provide guidance on the required APF?
- b. Does the substance have a prescribed Occupational Exposure Limit (OEL)? If there is no advice on the required APF in the MSDS, you can calculate the required protection level using the OEL and quantity of substance in the air.
- c. If there is more than one hazard present, e.g. dust and gas, you will need to find out the protection factor for each and choose appropriate RPE based on the highest protection factor required.

For more information about NPF, APF and OEL see page 46.



...continued

## STEP-BY-STEP GUIDE TO PROVIDING PROTECTION

**3 PROVIDE CE APPROVED RPE/PPE**

Now you have identified the hazards and assessed the risks you understand what protection factor you need. Next you need to consider what type of device is right for your organisation, its environment and the individuals who work there.

Here is an overview of the main respirator types, detailing the features and benefits of each type:

**Disposable Respirators**

In general, disposable respirators only protect the wearer from particulate hazards.

**Features of disposable respiratory products:**

- Different moulded shapes to suit individuals
- Valved or unvalved options – valved respirators reduce exhalation effort so they are cooler to wear and reduce misting of eyewear
- Most disposable respirators feature adjustable nose clips for added comfort

**Benefits of using disposable respirators:**

- Easy to use – no maintenance is required
- Hygienic – discard after use
- Cost-effective and versatile

**Reusable Respirators**

Available in full and half-mask options, reusable respirators protect the wearer from particulate and/or gas and vapour hazards depending on the filter type selected.

**Features of reusable respiratory products:**

- Wide variety of sizes, styles and filter types available to suit individual requirements
- Full and half-mask options – full face respirators also protect the eyes
- Hypoallergenic options also available

**Benefits of using reusable respirators:**

- Versatile; filters can be changed to protect from multiple hazards
- Can be recorded and used as part of the health and safety regulations relating to reusable RPE monthly inspection and maintenance records

**Powered Respirators**

One of the main benefits of using powered (or supplied air) over disposable or reusable respirators is that they don't require fit testing to be carried out. They use a battery powered fan and motor to draw contaminated air through a filter. The filter captures certain contaminants and clean air is fed to the wearer.

- Suitable for use over long shifts – no increase in breathing resistance
- Can offer integrated head, eye and face protection
- Allows the wearer to walk freely around without any trailing tubes

✗ Cannot be used to protect against substances with poor warning properties (taste/ smell)

✗ Must not be used in conditions that are oxygen deficient or immediately dangerous to life or health (IDLH)

**Air-fed Respirators**

Like powered respirators, airfed respirators don't require fit testing as the products are classed as loose fitting. They use breathable quality air supplied from a compressor via a tube. The compressed air is regulated to a gentle flow and fed to the wearer.

- Can be used to protect against substances with poor warning properties (taste/ smell)
- Can offer integrated head, eye and face protection
- Suitable for use over long shifts – no increase in breathing resistance

✗ Must not be used in conditions that are oxygen deficient or immediately dangerous to life or health (IDLH)

**4 TRAIN IN FITTING AND USE**

If RPE is not worn correctly it will not provide the required protection, so it is vital that you integrate RPE use into normal workplace activities and provide adequate training. It is often best, if possible, to give a choice of several adequate and suitable RPE to wearers so they can select the most comfortable.

All people involved in the selection, use, storage and maintenance (if necessary) of RPE require training. Ideally this needs should cover:

- Why RPE is necessary
- Hazards and their risks and effects
- The type of RPE being provided
- How it works
- Why fit testing is required (if relevant)
- How to wear and check equipment correctly
- Fit checking before use
- Details of maintenance required/when
- How to clean and store
- What to do if there's a problem with any RPE
- Responsibilities of both employer and employees
- RPE use and misuse

**Fit testing**

Face piece fit testing is a way of checking that a tight-fitting face piece (typically disposable and reusable respirators, although this can include half and full face masks, including those that form part of an air-fed or powered respirator) fits the wearer's facial features and forms an adequate seal. Fit testing of all tight fitting respirators is mandatory in the UK. In certain other countries, fit testing of tight fitting respirators is mandatory in certain industries. Further information about Fit Testing can be found at [www.fit2fit.org](http://www.fit2fit.org) – the UK Fit2Fit accreditation scheme for testers.

### NOMINAL AND ASSIGNED PROTECTION FACTORS

#### What are NPFs and APFs?

Nominal Protection Factors (NPFs) and Assigned Protection Factors (APFs) are simply a numerical rating indicating how much protection a device can offer. NPFs are derived exclusively from laboratory measurements, whilst APFs are derived from workplace measurements and represent the minimum protection factor that a trained wearer will achieve wearing the respirator in the workplace.

Unfortunately, there is not a standard approach to using NPFs and APFs across Europe. Some countries stipulate that NPFs should be used, whilst others like the UK, France and Germany stipulate that APFs should be used. Furthermore, some countries have different APF values for the same

class and type of respiratory protective device.

Therefore, it is always important to check and be familiar with national regulations and requirements when selecting and using respiratory protective devices.

**Example:** So wearing RPE with an APF of 10 will reduce exposure to the wearer by at least a factor of 10 (as long as RPE is used correctly). In the simplest terms, the RPE wearer will breathe in one-tenth or less of the amount of substance present in the air.

Nominal Protection Factors and Assigned Protection Factors used in different countries		NPF	3M Stated max. PF	APF UK	APF France	APF Germany	APF Italy
EN149 (Filtering Facepiece)	FFP1	4	4	4	4	4	4
	FFP2	12	12	10	10	10	10
	FFP3	50	50	20	10	30	30
EN12941 (Powered air Turbo with loose fitting headtop)	TH1	10	10	10	5	5	5
	TH2	50	50	20	20	20	20
	TH3	500	500	40	40	100	200

### OCCUPATIONAL EXPOSURE LIMITS

#### What are OELs?

An Occupational Exposure Limit (OEL) is a predetermined upper limit on the acceptable concentration of a hazardous substance in workplace air.

OELs are normally determined by workplace sampling and reviews of historical exposures and workplace health statistics. OELs are typically determined by competent national authorities

and enforced by legislation to protect workplace health and safety. Like APFs described above, OELs for any given chemical, material or class of material can vary from country to country across Europe, so it is important to also check and be familiar with national OELs when implementing a respiratory protection programme.



### FILTER TYPES

Main Respiratory Hazards Level 1	Sub-hazards Level 2	Sub-hazards Level 3	Examples	Typical Risks
Particulates (a suspension of particulates in air is called an aerosol)	Dusts	Dust	(Respirable Crystalline Silica from cutting concrete block)	Acute through to Chronic health effects, Explosion / Fire
		Metal fumes	Welding fume	Acute through to Chronic health effects
		Fibres	Asbestos	Acute through to Chronic health effects
		Bioaerosols	Moulds, bacteria, viruses	Acute health effects (sensitisation), Infection
	Mists	Mists	Fine mists from spray painting	Acute through to Chronic health effects, Explosion / Fire
Gases & Vapours	Gases		Sulphur Dioxide, Ammonia, Carbon Monoxide	Acute through to Chronic health effects, IDLH exposures - toxic / asphyxiation, Explosion / Fire
	Vapours		Mercury, Formaldehyde	
Oxygen Deficiency	Oxygen Deficient Atmospheres		<19.5% Oxygen	IDLH - asphyxiation

# Eye Protection

## INTRODUCTION

Welcome to our eye protection selection guide.

This guide helps you select the most appropriate protective eyewear for you and your business.

The guide includes a details of the risk types you may be subject to. It gives an overview of lens and frame markings and covers the European safety standards to be aware of when choosing. Selection tables provide all of the information you need to make a buying decision.



## WHY BUY FROM RS?

As industry experts we offer a wide range of protective eyewear for many environments and risk types. We stock professionally-approved RS products and many from market leading brands. This means you can find all the products you need from one source, with next day delivery, competitive pricing and bulk discounts.

## LENS MATERIALS

Polycarbonate lenses provide the highest impact level tested under EN166.

Acetate and CR39 lenses still give general impact protection but are geared more for longer duration against liquid and chemical splash situations.

Ventilated versions give an **extra aeration** to the anti-fog lens but still conform to the liquid and chemical splash requirements.

Non Ventilated (or sealed) also conform to the liquid and chemical splash requirements but in addition provide dust protection conformity.

## WHAT TYPE OF PROTECTION SHOULD YOU CHOOSE?

### Protecting yourself from MECHANICAL risks

Grinding work, particle projections, projections of metal filings or debris from tools.

Risks or Use	Symbol*	Safety Spectacles	Safety Goggles	Standard
Low energy impact 45 m/s	F			EN166
Medium energy impact 120 m/s	B	-		EN166
High energy impact 190 m/s	A	-	-	EN166

The F, B or A symbol must be indicated on the lens and the frame to guarantee protection from mechanical risks. If the symbols differ, the symbol representing the lowest resistance is applied to the protection as a whole.

### Protecting yourself from ELECTRIC risks

Protection from live contact and short circuit electric arcs.

Risks or Use	Symbol*	Safety Spectacles	Safety Goggles	Standard
Short-circuit electric arc	8	-	-	EN166

The 8 symbol must be indicated on the lens and the frame to guarantee protection from electrical risks.

### Protecting yourself from THERMAL risks

Sprays of hot liquids or solids, intense heat radiation, radiating heat from furnaces.

Risks or Use	Symbol*	Safety Spectacles	Safety Goggles	Standard
Spray of molten metals and hot solids	9	-		EN166

The 9 symbol must be indicated on the lens and the frame to guarantee protection from thermal risks.

### Protecting yourself from RADIATION risks

Exposure of the eyes to high intensity, ultra violet, infra-red and visible light sources, welding activities, steelworks, surgery.

Risks or Use	Symbol*	Safety Spectacles	Safety Goggles	Standard
Ultraviolet radiation	2			EN166 EN170
Infra-red radiation	4			EN166 EN171
Solar radiation for industrial use	5 or 6			EN166 EN172
Electric welding	EN175 for the hood EN379 for the filter	-	-	EN166-169 EN175 EN379
Gas welding	1.7/3/5			EN166 EN169
Laser radiation	R1 to R5 LB1 to LB10			EN207 EN208

The standard is identified on the lens markings.

### Protecting yourself from CHEMICAL risks

Protection from toxic dust, aerosols, dangerous liquids, gas or toxic vapours.

Risks or Use	Symbol*	Safety Spectacles	Safety Goggles	Standard
Liquid droplets	3	-		EN166
Liquid splashes	3	-		EN166
Large dust particles > 5 microns	4	-		EN166
Gas and fine dust particles < 5 microns	5	-		EN166

The 3, 4 and 5 symbol or symbols must be indicated on the frame. If none of these symbols is indicated in the markings, then the equipment is not suitable for chemical risks.

### MANDATORY MARKINGS

#### Lens and frame marking is specific to each product

Each marking corresponds to a very specific use. Certified by independent laboratories, this information guarantees protective eyewear quality and resistance.



#### Code (field of use)

2 or 3: UV filter (EN170)  
4: IR filter (EN171)  
5 or 6: solar filter (EN172)

#### Colour perception

C: unimpaired colour perception

#### Protection class

1.2 to 6: degree of visible light filtration

#### Crown

Manufacturer identification  
Bollé Safety

#### Optical class

1: high optical quality  
No optical distortion (suitable for permanent wear)

#### Mechanical strength

##### Mandatory marking on frame and lens

**S** Extra strong, resists a 22 mm 43 g ball falling 1.30 m at 5.1 m/s.  
**F** Low energy impact, resists a 6 mm, 0.86 g ball at 45 m/s.  
**B** Medium energy impact, resists a 6 mm, 0.86 g ball at 120 m/s.  
**A** High energy impact, resists a 6 mm, 0.86 g ball at 190 m/s.  
**T** The letter T, immediately after the mechanical strength symbol, authorises use in an environment in which high speed particles at extreme temperatures are present.

##### Marking on the lenses only

**K** Resistance to surface damage by fine particles (optional).  
**N** Resistance to fogging (optional).

### EUROPEAN STANDARDS

#### Basic Standards

**EN166** Guarantee of minimum protection against everyday risks (dropping, sun-ageing, heat exposure, corrosion, etc.)  
**EN167** Optical test methods.  
**EN168** Test methods other than optical.

#### Standards by type of application

Identified by a code (field of use) which is on the lens marking.

**EN169** Welding filters.  
**EN170** Ultra-violet filters (code 2 or 3).  
**EN171** Infra-red filters (code 4).  
**EN172** Industrial use solar protection filters (code 5 or 6).  
**EN175** Equipment for welding (presence of the EN175 on the product).  
**EN207** Laser protection glasses (code LB1 to LB10).  
**EN208** Laser adjustment glasses (code R1 to R5).  
**EN379** Specification covering welding filters

#### Frame Marking

The frame must include:

- CE symbol • Manufacturer • Use & strength symbols
- EN standard (if applicable)

#### Symbols explained:

##### Only on the frame (chemical protection)

- 3** Liquid droplets or splashes.
- 4** Large dust particles > 5 microns.
- 5** Gas and fine dust particles < 5 microns.

##### Mandatory marking on frame and lens

- 8** Electrical short circuit arc.
- 9** Molten metal and hot solids.

#### Lens Markings

Lens marking must include:

- The scale number for filtering lenses (code).
- The manufacturer's name (logo or brand recommended by the manufacturer).

#### Symbols explained:

- 1** Continuous work - Worn permanently
- 2** Non-continuous work - Worn intermittently
- 3** Occasional work, must not be worn permanently.
- 8** Electrical short circuit arc.
- 9** Molten metal and hot solids.

### WARNING

- F.** Maximum protection for glasses
- B.** Maximum protection for goggles
- A.** Maximum protection for face shields

If the S, F, B, A and T symbols do not apply to both the lens and frame, then the lowest level must be assigned to the complete protective eyewear

### WHY USE OVER SPECTACLES?



Overspectacles are designed to fit over most users' prescription spectacles with minimal interference.

They offer an excellent coverage and field of vision, combined with a high level of protection against impacts.

# Footwear

## INTRODUCTION

Our guide to protective footwear is designed to give you the key information and features you need to buy footwear for you and your employees.



Our footwear is purpose designed to protect the foot from workplace injury. All include toe protection (toe cap) and many offer additional protection to other parts of the foot.

### WHY BUY FROM RS?

As industry experts we offer a many styles of protective footwear for working environments indoor and out, as well as for many different risk types. Our stock covers professionally-approved RS Pro products plus a selection of market leading brands. This means you can find all the products you need from one supplier, with next day delivery, competitive pricing and bulk discounts.

### WHERE TO USE ESD FOOTWEAR

Through its sole construction, ESD (or Electrostatic Dissipative) footwear provides a safe and controlled method of discharging the body's static electricity. ESD footwear is designed for the electronics industry and any assembly line where sensitive electronics are fitted, as well as the explosives industry.



## SAFETY RATINGS

Select safety footwear suitable for your work environment and tasks being carried out.

EN ISO 20345: 2011 Requirements	SB	SB-P	S1	S1P	S2	S3	S4	S5
• Safety Footwear With A Toe Cap Offering Impact Protection To 200 Joules	✓	✓	✓	✓	✓	✓	✓	✓
• Closed Heel Area			✓	✓	✓	✓	✓	✓
• Energy Absorption of Heel Area			✓	✓	✓	✓	✓	✓
• Antistatic			✓	✓	✓	✓	✓	✓
• Resistance to Fuel & Oil			✓	✓	✓	✓	✓	✓
• Water Penetration and Absorption Resistant Upper					✓	✓		
• Penetration Resistance Midsole		✓		✓		✓		✓
• Cleated Outsole						✓		✓
• Entirely Moulded Polymer/Rubber Upper Making Them Waterproof And Leak Proof							✓	✓

### TOE CAP MATERIALS



**Steel**  
These offer protection from potentially dangerous machinery, equipment and falling objects. Steel toe caps are the heaviest material so are not the best for comfort.



**Aluminium**  
Strong and lighter in weight than steel toe boots while still keeping your feet protected.



**Composite**  
Light in weight, these won't set off metal detectors. Ideal for extreme high or low temperatures because they don't conduct heat or cold as quickly as metal.



# Sizing Charts

## UK/EUR SIZE COMPARISON

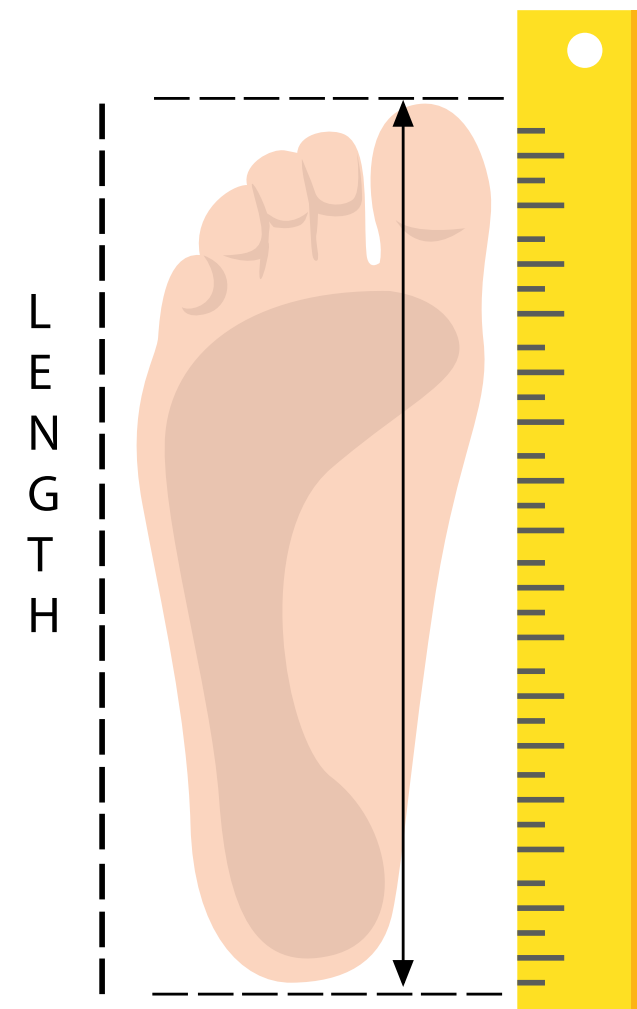
Exact UK/Eur sizings differ by manufacturer. This table shows UK sizes against European sizes for each manufacturer so you can be sure of buying the size you need.

Brand	EUR Sizes													
	35	36	37	38	39	40	41	42	43	44	45	46	47	48
		3	4	5	6	6.5	7	8	9	10	10.5	11	12	13
	2	3.5	4	5	6	6.5	7	8	9	10	10.5	11	12	
					6		7	8	9	10		11	12	
		3	4	5	6	6.5	7	8	9	10	10.5	11	12	
						6	7	8	9	10	11	12		
		3	4	5		6	7	8	9	10	11		12	
					6		7	8	9	10		11	12	
							7	8	9	10	10.5	11	12	
	3	3.5	4	5	6	6.5	7	8	9	10	10.5	11	12	

## CORRECT MEASUREMENT

Here we show the correct method of measuring foot size in order to obtain the appropriate protective footwear.

The distance to measure is between a parallel line drawn at the back of the heel and a parallel line at the front of the big toe.



# Head Protection

## INTRODUCTION

Our head protection guide will help you choose the most appropriate protective headwear for your task or environment.

Hard hats are designed to protect the vulnerable head area from falling objects and other workplace hazards. In many work areas the provision of a hard hat is a requirement under the PPE regulations and should be enforced for worker protection.



## WHY BUY FROM RS?

As industry experts we offer a range of head protection products, from professionally approved RS branded products, to those from selected market leading brands. This means you can find all the products you need from one source, with next day delivery, competitive pricing and bulk discounts.

## HARD HAT COLOUR CODING

Hard hats are supplied in various colours, each often signifying the role or task of the wearer.

Colours may vary from one company to another, and some organisations change colour coding every three to five years to remove any old helmets from their site.



**Note:** Other colours are also available in some ranges.

## WHEN TO USE A BUMP CAP

A bump cap is designed to be used when risk to the user is from overhead stationary obstacles and not moving or falling objects when a hard hat should be worn. Compared to the hard hat, bump caps offer a lower level of head protection as defined in the standard BS EN 812:2012.

Bump caps offer the following benefits to the wearer:

### Lightweight

Constructed of fabric with a protective shell of HDPE or ABS, bump caps have low weight for added comfort.



### Washable

Being made of cotton or canvas means that caps can be kept clean for repeat wear or for different personnel and visitors.

### Easy to wear

Where there is a need to combine head protection with other PPE, such as respiratory equipment, bumps caps make this easy.

## EN STANDARDS

### Industrial safety helmets EN 397



This key standard specifies mandatory and optional physical and performance requirements (shock absorption, penetration resistance, flame resistance and chin strap attachment), including methods of test and marking requirements of industrial safety helmets.

### Helmets for mountaineers EN 12492



Safety requirements and test methods. This European Standard specifies safety requirements and test methods for safety helmets for use in mountaineering. EN 12492 tests include penetration resistance, shock absorption and chin strap release & strength.

### Electrically insulating helmets EN 50365



For use on low voltage installations. Hard hats used in an area where there is risk of contact with voltages of 1,000V AC or 1,500V DC must meet this standard. Tests measure the electrical insulation of the helmet in water.

### High performance industrial helmets EN 14052



This is a higher specification standard and helmets meeting the requirements will give the wearer additional protection for side impacts and helmet penetration.

### Industrial bump caps EN 812



The European Standard specifying physical and performance requirements, methods of test and marking requirements for industrial bump caps. Industrial bump caps are intended to provide protection to the wearer against the effects of striking the head against hard, stationary objects.

# Fall Protection

## INTRODUCTION

Fall protection from RS covers a wide range of safety products designed to protect personnel from injury or death due to a fall from height.

Our range includes fall arrest harnesses plus many essential accessories from lanyards to lifelines to grab kits. As with other PPE, the wearing of fall arrest or fall protection equipment is, where needed, a requirement under the PPE regulations 2002.



## WHY BUY FROM RS?

As industry experts we hold in stock an extensive range of fall protection equipment. Products from many leading brands such as 3M, JSP, Petzl and Protecta are available to order for delivery or collection. You'll find all the products you need from one source, with technical support, competitive pricing and bulk discounts.

## WORKING AT HEIGHT

Working at height means working in any scenario where a person could fall a distance likely to cause personal injury. For example this could include working on a roof or falling into an opening in a floor or a hole in the ground or working on or adjacent to fragile surfaces.

Before working at height you must work through these simple steps:

- Avoid working at height where it is reasonably practical to do so
- Where work at height cannot be avoided, prevent falls using either an existing place of work that is already safe or establishing controls that prevent a fall
- Where it is not reasonably practicable to prevent a fall from happening - minimise the consequences of a fall by using the right Fall Arrest Equipment

### Other points to consider:

- Always do as much work as possible from the ground
- Ensure workers can get safely to and from where they work at height
- Ensure equipment is suitable, stable and strong enough for the job, as well as maintained and checked regularly
- Make sure you don't overload or overreach when working at height
- Take precautions when working on or near fragile surfaces
- Provide protection from falling objects
- Consider your emergency evacuation and rescue procedures



## PROVIDING A PROMPT RESCUE

Rescue after a fall is a good problem to have. It means a worker was wearing their harness properly, was attached to an anchor and using their gear correctly. However prompt rescue is critical. Why?

### Before the fall

The worker may have been struck by a falling object or have a medical condition



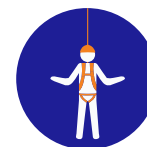
### During the fall

They may have been in a collision with part of the structure



### After the fall

The worker can suffer from the effects of being suspended in a harness



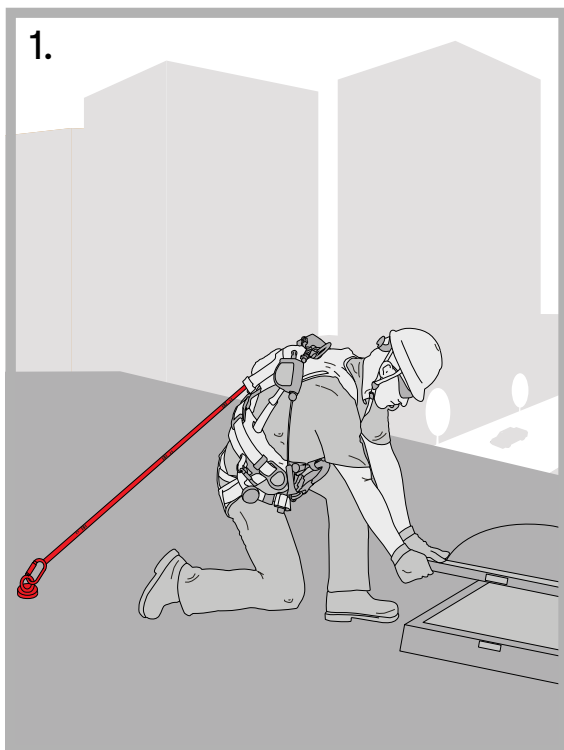
## < 10 minutes

Recommendation for rescue time is less than 10 minutes. Otherwise compromised blood flow can cause immobility, dehydration and other complaints.



## TYPES OF FALL PROTECTION LANYARD

Lanyard types are shown in the tables as being one of three types. These are described below:



### 1. Restraint

Fall prevention lanyards offering work restraint are designed and rigged to eliminate the possibility of workers falling to lower levels. Restraint lanyards must be of a length that when attached to a suitable anchor point, the user cannot go beyond the edge where the potential for a fall exists.



### 2. Work positioning

Work positioning activities involve the worker being either fully or partially supported by their equipment. The work positioning lanyard also comes under the title of fall prevention and enables the user to be partially supported on a structure or fixed ladder and use both hands to complete a task, while maintaining stability.



### 3. Fall arrest

Whilst fall prevention protects the worker by eliminating the risk of falling, it is recognised that it is not always reasonably practicable to achieve this. In such instances, and as a last resort, personal fall arrest systems are normally implemented. Unlike fall prevention, fall arrest assumes the inevitability of a fall, and is designed to minimize the consequences of a fall by preventing the worker from hitting the level below and limiting the forces in arresting the faller.

Lanyards used as part of a fall arrest system are labelled as such.

# Workwear

## INTRODUCTION

We offer an extensive selection of protective workwear for indoor or outdoor use. Choose the most appropriate items for your work environment from a variety of types including weatherproof, hi-vis and disposable.

This guide brings you clothing and accessories from trousers, jackets and overalls to lab coats, aprons and knee pads. Consult the attributes and features you need to make an informed choice for you and workplace personnel.



## WHY BUY FROM RS?

As industry experts we offer a range of protective workwear products for every requirement and environment, from professionally approved RS Pro products, to those from selected market leading brands. This means you can find all the products you need from one source, with next day delivery, competitive pricing and bulk discounts.

## HI-VIS STANDARD EN ISO 20471

The standard for high-visibility clothing specifies requirements for clothing to be visible in daylight and in the dark. It defines colour, retroreflection, minimum area and placement of reflective materials. The standard divides into 3 classes:

### Class 3

The highest level required for personnel working on or near motorways, dual carriageways and airports. Garments must cover the torso and have a minimum of sleeves with reflective bands.



**Note:** If a sleeve can block a clear view of two reflective bands on the torso, then the sleeve must be surrounded by two reflective bands.

### Class 2

The intermediate level for use when working on or near Class A or B roads. Class 2 encompasses sleeveless waistcoats, tabards, bib and brace trousers etc.



### Class 1

The minimum amount of visibility when working on a private road or with others who are wearing a garment of a higher class.

These are garments such as simple sleeveless waistcoats where the area of surface material and corresponding reflective material does not conform to either Class 2 or 3.



There are only 3 colours of hi-vis clothing recognized by this Standard: Yellow, Red, and Orange

## HOW TO MEASURE YOURSELF

### Chest size

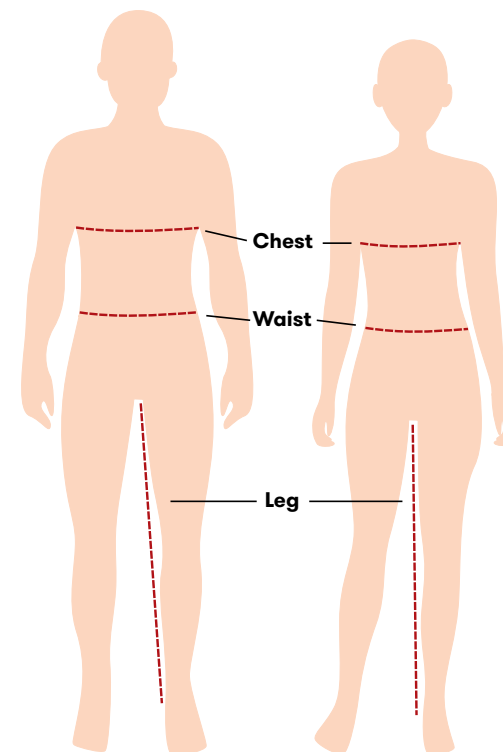
Measure by wrapping the tape measure around the widest part of your chest, under the armpits.

### Waist size

Pass the tape measure around your natural waistline, below your ribs and above the top of the hips.

### Inside leg length

Measure on the inside of the leg, starting at the crotch and finishing at the top of your ankle.



## EUROPEAN STANDARDS

Our range of protective clothing and workwear complies with various European Standards. Each is indicated on our website for the garment in question.

Below is a summary of workwear standards:



**EN 342** Protective clothing. Ensembles and garments for protection against cold.



**EN 343** Protective clothing. Protection against rain.



**EN 467** Protective clothing. Protection against liquid chemicals. Performance requirements for garments providing protection to parts of the body.



**EN 470-1** Protective clothing for use in welding and allied processes. General requirements.



**EN 471** High-visibility warning clothing for professional use. Test methods and requirements.



**EN 530** Abrasion resistance of protective clothing material.



**EN 531** Protective clothing for workers exposed to heat.



**EN 533** Protective clothing. Protection against heat and flame. Limited flame spread materials and material assemblies.



**EN 1149-1** Protective clothing. Electrostatic properties. Test method for measurement of surface resistivity.



**EN 1149-5** Protective clothing. Electrostatic properties. Material performance and design requirements.



**EN 1150** Protective clothing. Visibility clothing for non-professional use. Test methods and requirements.



**EN 5077/25077** Textiles. Determination of dimensional change in washing and drying.



**EN 11611** Protective clothing for use in welding and allied processes.



**EN 11612** Protective clothing. Clothing to protect against heat and flame. Minimum performance requirements.



**EN 12947** Textiles. Determination of the abrasion resistance of fabrics by the Martindale method.



**EN 13034** Protective clothing against liquid chemicals. Performance requirements for chemical protective clothing offering limited protective performance against liquid chemicals [Type 6 and Type PB [6]].



**EN 13688** Protective clothing. General requirements. Replaces earlier **EN 340**.



**EN 13934** Textiles. Tensile properties of fabrics.



**EN 13937** Textiles. Tear properties of fabrics.



**EN 14058** Protective clothing. Garments for protection against cool environments.



**EN 14116** Protective clothing. Protection against flame. Limited flame spread materials, material assemblies and clothing.



**EN 14605** Protective clothing against liquid chemicals.



**EN 20471** High visibility clothing. Test methods and requirements. Replaces earlier **GO/RT 3279 ISSUE 8**.



**EN 61482** Live working. Protective clothing against the thermal hazards of an electric arc. Test methods. Method 2: Determination of arc protection class of material and clothing by using a constrained and directed arc (box test).

# Disposable Workwear

## INTRODUCTION

Our disposable workwear range brings you a selection of essential products to protect the body when working with potentially hazardous substances. We set out the key ranges we offer and help you decide what to buy for yourself and others in the workplace.



## WHY BUY FROM RS?

As industry experts we offer a wide range of disposable workwear. From our own RS Pro brand to those from leading brands 3M, Du Pont, Kimberly-Clark and Tyvek. With us, you will find all the products you need from one source, with next-day delivery, competitive-pricing and bulk discounts.

## PROTECTION TYPES

Depending on the materials and construction, protective coveralls can be for either hazardous (CE Category III) or non-hazardous (CE Simple Category I) applications. Products for hazardous applications can be tested and certified to any of six different "Type" standards, providing guidance on their use:

Category	Protection Type	
<b>CE Category III</b>	<b>1. Gas Protection</b>	High ↑ Protection ↓ Low
	<b>2. Non-Gas Protection</b>	
	<b>3. Liquid Jet Protection</b>	
	<b>4. Liquid Spray Protection</b>	
	<b>5. Particle Protection</b>	
<b>6. Limited Liquid Splash Protection</b>		
<b>CE Category I</b>	<b>CE Simple</b>	

## DISPOSABLE COVERALL MATERIALS

Coveralls and overalls offer the wearer a means of protection from liquids and particles and will usually be worn over normal clothing.

The decision of whether to invest in disposable or reusable coveralls should be based on factors such as the amount of likely contamination of the material, amount of dirt/soiling or ease of washing out (e.g. paint) from the garment.



Disposable coveralls, constructed of plastic based materials, offer light weight and can be worn comfortably over everyday clothes. Our disposable coveralls range is available in materials designed to withstand various environmental hazards.

### PE Laminate

Polyethylene laminate is lightweight, breathable fabric which offers good protection from non-hazardous liquids and dust.

### HDPE

High density polyethylene is a solvent resistant spun material which offers comfort, light weight and acts as a barrier to hazardous dry particles and light splashes.

### SMS

SMS, or spun-melt-spun, is a fabric designed to offer both light weight and a physical barrier to liquid splashes and hazardous particles.

### Polypropylene

Polypropylene is a common plastic material that when spun and woven into a material offers a good barrier to non-hazardous particles and liquids.

## WHY YOU SHOULD DISPOSE

We summarise the key reasons why you should consider disposing of coveralls and other workwear:



To avoid the risk of personal contamination from hazardous materials causing skin complaints and skin diseases.



Avoids repeated contaminant exposure from garments or through inhalation of dusts whilst putting on workwear (if associated PPE is not in place at the time).



Averts risk of exposure to others, for example, when transferring from workplace to personal environment through contamination via 'out of work' clothes.



To limit risk to the environment. Contaminants may be transferred to other areas where no exposure is intended.



Prevents risk to the work application. Over-used workwear items can shed lint which in some environments, e.g. paint spraying, can cause damage.



Reduces risk of degradation of topical treatments, e.g. EN 1149 Antistatic, after repeated wear. This could otherwise degrade the performance of the garment.



Maintains good hygiene. This can be a concern in high heat environments.