

## HOW DO WE TEST OUR HIGH-VISIBILITY GARMENTS TO EN ISO 20471 AND RIS-3279-TOM?



A Retroreflectometer is used to check the performance of retroreflective tape. Every roll of tape is tested to ensure it meets and exceeds the standard requirements. The retroreflectometer measures the coefficient of two rotating angles. EN ISO 20471 states the reading should not be below 330 (cd/lx.m<sup>2</sup>) however at Portwest we insist on a reading of 400 (cd/lx.m<sup>2</sup>) plus.



A spectrophotometer is used to check the chromaticity – “colour intensity” – of fabric. We use this to ensure every roll of fabric meets the requirements of EN ISO 20471 and RIS-3279-TOM.



RIS imposes a higher concentration for high visibility orange fabric for railway workers. This increases the conspicuous nature of the fabric and ensures that the rail worker is more visible.

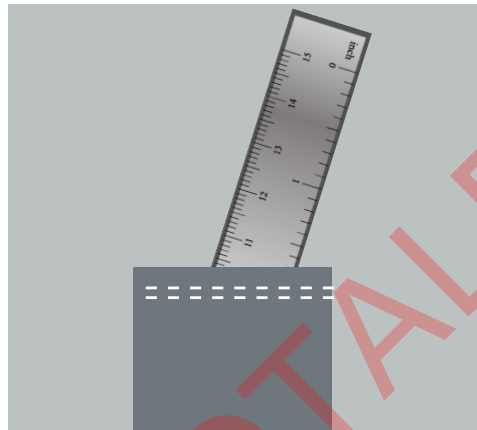


## EN ISO 11611 PROTECTIVE CLOTHING FOR USE IN WELDING AND ALLIED PROCESSES



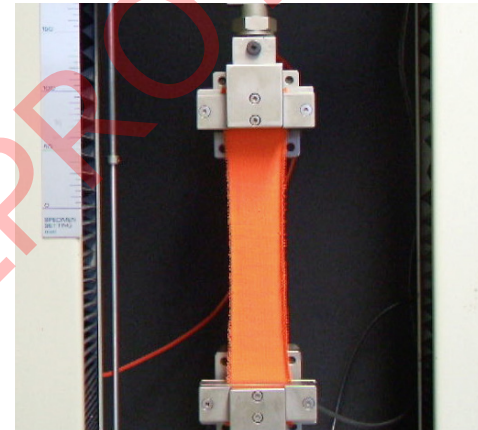
### FLAP POCKETS

In order to comply with EN ISO 11611 all external pockets must be flapped, except for side pockets below the waist which do not extend more than ten degrees forward of the seam.



### RULE POCKETS

A single rule pocket with an opening not greater than 75mm is permitted behind the side seam on one or both legs.



### TENSILE AND TEAR STRENGTH

To meet EN ISO 11611 tensile strength must be at least 400N and tear strength must be at least 15N for class 1 and 20N for class 2.

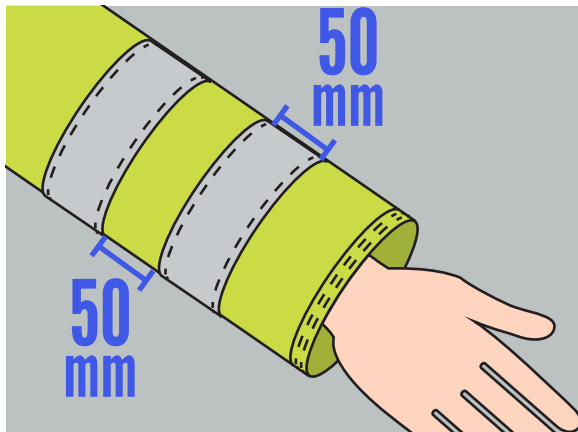


Portwest's winning FR50 style has a tensile strength value of at least 500N and tear strength of at least 25N after 50 washes.

**ALL PORTWEST GARMENTS CERTIFIED TO EN ISO 11611 MEET THESE REQUIREMENTS**



## EN ISO 20471 RETRO-REFLECTIVE TAPE MUST MEET THE FOLLOWING PARAMETERS:



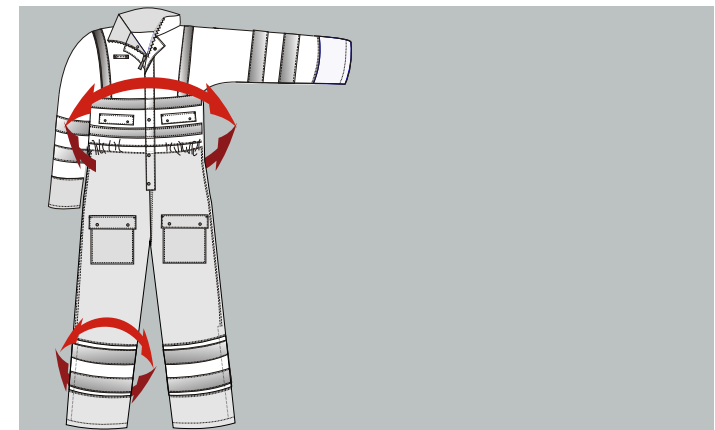
### REFLECTIVE TAPE

Reflective tape must be at least 50mm wide. Bands of reflective tape must be positioned at least 50mm apart.



### DISTANCE FROM HEM

Reflective tape must be positioned 50mm or more from the end of sleeve or leg.



### ALL AROUND THE BODY

Reflective tape must encircle torso and/or limbs to be included in the calculation of the necessary square area of reflective tape. A gap (for fastening system or seam) in the band of reflective tape must be 50mm or less. The total amount of such gaps in every band must not exceed 100mm around the torso and 50mm around the sleeves and legs.

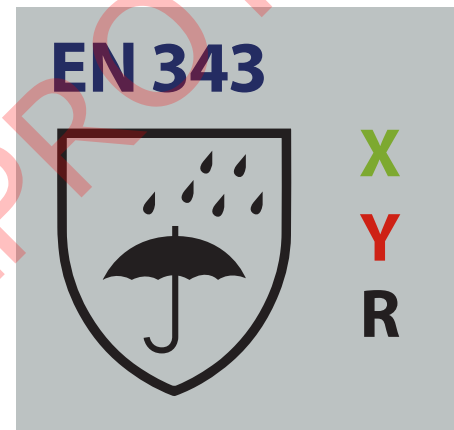
ALL PORTWEST HI-VIS GARMENTS USING RETRO-REFLECTIVE TAPE CONFORM TO ABOVE REQUIREMENTS

## WHAT IS EN 343?



### EN343

EN343 is the European standard that applies to garments worn in adverse weather conditions. This standard specifies requirements and test methods applicable to the materials and seams of protective clothing against the influence of precipitation (e.g. rain, snowflakes), fog and ground humidity.



The above pictogram indicates that protection against rain is offered.

The standard provides for two performance parameters of which there are 4 levels with Class 4 offering the highest level of protection.

- X** Water Penetration Resistance (Waterproofness) 4 Levels
- Y** Water Vapour Resistance (Breathability) 4 Levels
- R** Readymade Garment; Rain Tower Test (optional)  
R may be replaced by an X if the test has not been carried out or is not suitable.



ALL PORTWEST RAINWEAR GARMENTS CONFORM TO EN 343 REQUIREMENTS

## WHAT IS EN 342?



EN342 is the European standard that applies to garments worn in cold environments. This standard specifies requirements and test methods for the performance of clothing ensembles (i.e two-piece suits/coveralls) for protection against the effects of cold environments equal to or below -5°C.

### Wear Time

The manikin test measures the amount of energy required to maintain warmth. This result is expressed in square metres Kelvin per Watt (m<sup>2</sup>K/W) this result can be used to estimate the maximum wear time based on the activity level of the wearer, the temperature of the environment and insulation value of the garment.



0.336 I<sub>cler</sub> (m<sup>2</sup>K/W) (Thermal Insulation)  
 2 (Air Permeability)  
 X (Water Penetration Resistance)

### EN 342

Garment Insulation I <sub>cler</sub> (m <sup>2</sup> K/W)	Wearer Activity (Light)				Wearer Activity (Medium)			
	Air Velocity (m/s)				Air Velocity (m/s)			
	0.4		3		0.4		3	
	8hr	1hr	8hr	1hr	8h	1hr	8hr	1hr
0.336	-2	-18	6	-8	-18	-36	-7	-22

A person wearing S463 performing light activity can withstand **-2°C for 8hrs and -18°C for 1hr**. A person performing Medium activity can withstand **-18°C for 8hrs and -36°C for 1hr**.



EN 342

### There are three main parameters:

- A Thermal insulation** (this is tested using a full-size moving mannequin & measures the amount of energy required to maintain warmth)
- B Air Permeability** (This is a measure of how windproof the garment is), AP, Class 1-3 (where 3 is best)
- C Water penetration** (waterproofness) Class 1-2 (where 2 is best); optional test



EN 342

### The following styles are certified to EN 342:

S427, S426, S768, S766, S765, RT27, C468, RT32, S266, S463, C465, C466, C467, S464, G465, C565, S434, S461, S460, RT30, RT34, R460, S467, S462, S360, S466, FR59, S433, CS10, S437, S686, S482, S489, CS11, FR58, CS12, S485, S585, FR53

## EN 812:2012

## CERTIFIED INDUSTRIAL BUMP CAPS



### IMPACT / SHOCK ABSORPTION

Bump caps are intended to protect the wearer from static objects (e.g. walking into low ceilings or hanging obstructions).



To achieve the impact test, a 5 kg fl at striker is dropped onto the bump cap from a height of 250 mm, with a maximum allowable transmitted force of 15 kN. Impacts are carried out on the front and rear of the bump cap, with the headform tilted at 30° and 60° to reflect the nature of any impacts likely in use.



### PENETRATION

Bump caps are intended to provide protection against sharp or pointed objects (such as corners or protruding elements of static objects)



A penetration test is carried out at lower energy and involves a 500g striker being dropped from a height 500mm onto the bump cap fitted to a fixed headform.



ALL PORTWEST BUMP CAPS PS59, PW59, PW69, PW79 & PW89 SURPASS THE EN 812 STANDARD



## THAT EN ISO 20471 HAS 3 PERFORMANCE LEVELS:



### THE 3 CLASSES

Class 3: Highest Level  
Class 2: Intermediate Level  
Class 1: Minimum Level



### CLASS 3: HIGHEST LEVEL

Highest level of protection - required for any persons working on or near motorways, dual-carriage ways or airports. Must incorporate a minimum of 0.80m<sup>2</sup> of background material and 0.20m<sup>2</sup> of retro-reflective materials. (4 metres of 5cm wide reflective tape)



### CLASS 2: INTERMEDIATE LEVEL

Required for any persons working on or near A and B class roads, also for delivery drivers. Must incorporate a minimum of 0.50m<sup>2</sup> of background material and 0.13m<sup>2</sup> of retro-reflective material. (2.60 metres of 5cm wide reflective tape)



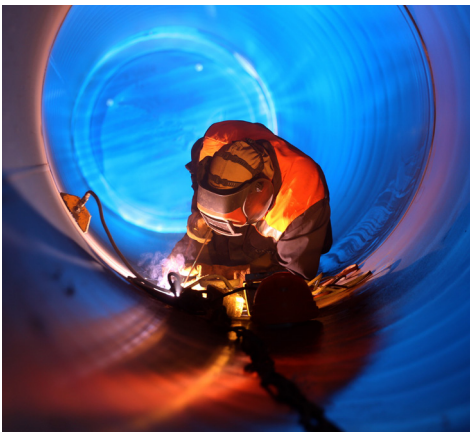
### CLASS 1: MINIMUM LEVEL

Minimum level of protection required for any persons working on a private road or to be used in conjunction with a higher classed garment. Must incorporate a minimum of 0.14m<sup>2</sup> of background material and 0.10m<sup>2</sup> of retroreflective material. (2 metres of 5cm wide reflective tape)

## WHAT IS EN ISO 11611?



EN ISO 11612



BIZ1



FR50



### PROTECTION AGAINST...

This international standard specifies minimum basic safety requirements and test methods for protective clothing for use in welding and allied processes (excluding hand protection). There are two classes with specific performance requirements.

### CLASS 1 LEVEL PROTECTION

Class 1 is protection against less hazardous welding techniques and situations, causing lower levels of spatter and radiant heat.

### CLASS 2 LEVEL PROTECTION

Class 2 is protection against more hazardous welding techniques and situations, causing higher levels of spatter and radiant heat.

### TESTING.

The EN ISO 11611: standard has the following parameters:

- Tensile Strength
- Tear strength
- Busting strength
- Seam strength
- Dimensional change
- Requirements of leather
- Limited Flame Spread (A1 + A2)
- Molten Droplets
- Heat Transfer (radiation)
- Electrical resistance

PORTWEST HAS 72 STYLES CERTIFIED TO THE EN ISO 11611: STANDARD

## WHAT IS 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] equipment). This standard specifies the minimum requirements for limited use and re-useable limited performance chemical protective clothing.

### AREAS OF USE

Limited performance chemical protective clothing is intended for use in cases of a potential exposure to a light spray, liquid aerosols or low pressure, low volume splashes, against which a complete liquid permeation barrier (at a molecular level) is not required.

### TYPE 6 REQUIREMENTS

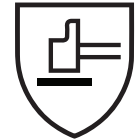
Type 6 Chemical Protective suits must cover and protect at least the trunk and the limbs, Example One piece coveralls or two piece suits, with or without hood, boot-socks or boot covers.

### TYPE PB [6] REQUIREMENTS

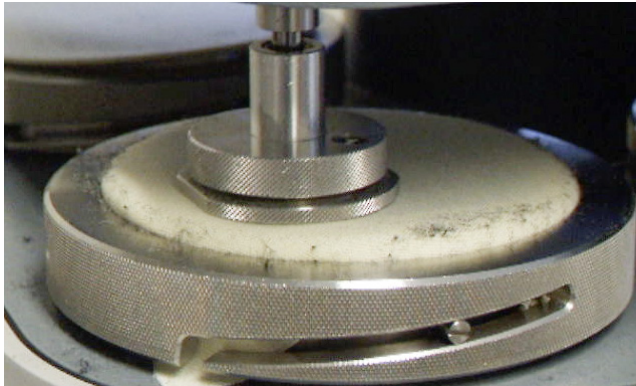
Type PB [6] Partial body protection covers and protects only specific parts of the body. Example coats, aprons, sleeves.



## WHAT ARE THE CHANGES TO EN388?



EN 388



### REVISION TO ABRASION TEST

The Abrasion Test is designed to give an indication of the durability of the gloves. The performance levels are still the same but the sandpaper used to perform the test has been changed from 100 grit to a finer 180 grit material.

Test	Level 1	Level 2	Level 3	Level 4
<b>Abrasion Resistance (number of cycles)</b>	<b>100</b>	<b>500</b>	<b>2,000</b>	<b>8,000</b>

### NEW IMPACT TEST

A new test to measure impact protection was added to the EN388 standard. The method for testing is:

- Impact applied to the palm, back or knuckle area of the hand
- Uses the existing motorbike impact test EN13594:2015
- 2.5kg weight is dropped to exert a 5 joules energy impact
- Pass is achieved if the gloves reach level 1
- P is added to the glove's certification markings



### REVISION TO CUT TEST

The method for testing the cut resistance of gloves has been typically carried out using a circular blade which moves back and forth across the surface of the gloves. This test is commonly referred to as the Coup Test. The revisions to the Coup Test are:

- Circular blade test stops at 60 cycles
- New blade used for every cut
- If cutting factor is greater than 3 (i.e. difference in performance of the reference material against the test material) the straight blade test becomes the reference test.
- The Coup Test does not have to be referenced if referencing the Straight Blade Test. In this case it will be marked with an X.

Test	Level 1	Level 2	Level 3	Level 4	Level 5
<b>Circular blade cut resistance (number of cycles)</b>	<b>1.2</b>	<b>2.5</b>	<b>5</b>	<b>10</b>	<b>20</b>



### STRAIGHT BLADE TEST (ISO 13997)

The Straight Blade test can be used in lieu of the Coup Test. It should also be used if the Coup Test reaches 60 cycles or if the cutting factor is greater than 3.

- The test is conducted on a TDM 100 machine
- Tests are conducted using a new blade every time, blunting is not a factor
- Increasing levels of force are applied, 2 newtons up to 30 newtons
- Letter score is applied A – F, F being the highest
- The letter reference is applied in lieu of or along with the cut number reference

TDM Test Method: EN ISO 13997	Level A	Level B	Level C	Level D	Level E	Level F
<b>Straight blade cut resistance (N)</b>	<b>2</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>22</b>	<b>30</b>



## WHAT IS DIN 51130:2014? SLIP RESISTANCE STANDARD



### WHAT IS DIN51130:2014?

This standard specifies a method which serves as a suitability test for the determination and classification of anti-slip properties of floor coverings intended to be used in workrooms and work related areas with slip hazards.

### HOW IS THE TEST PERFORMED

A test person with test shoes walks forwards and backwards in an upright position over the floor covering to be tested, the slope of which is increased from the initial horizontal state to the acceptance angle. The average acceptance angle reached serves to assess the degree of anti-slip. The acceptance angle is determined on floor coverings on which a lubricant has been applied.

35%

**OF MAJOR INJURIES** in the food and drink industries are slip and trip injuries causing a broken arm or requiring hospitalisation.

90%

**OF SLIPS** occur when the floor is wet or contaminated with food product.

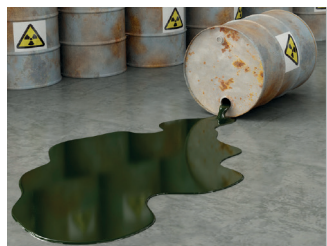
75%

**OF TRIPS** are caused by obstructions, the remainder by uneven surfaces.

Source: <http://www.hse.gov.uk/food/slips.htm>



## MT52 ANTI-SLIP AND ANTI-FATIGUE IS DIN51130:2014 CERTIFIED



### ANTI-SLIP PROPERTIES

The MT52 is certified to DIN51130:2014. It is rated R10 making it suitable for floors in work rooms and areas where there is an increased risk of slipping due to grease, oil, water, leftovers, dust, flour, plant clipping, etc.

R10  
RATED



MT52

### ANTI-FATIGUE PROPERTIES

It alleviates pressure on your feet, this stimulates blood circulation, reduces stress on leg joints, your lower back and major muscle groups.



MT50

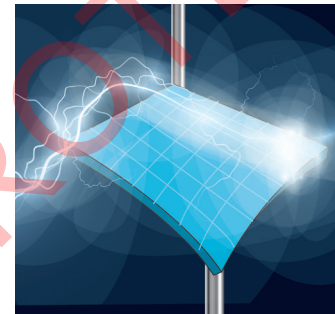
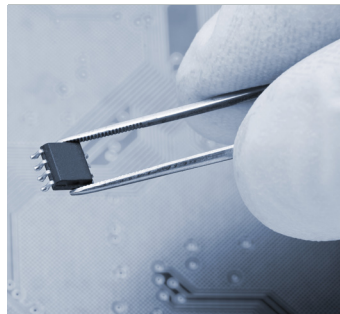


MT51

Portwest have three styles certified to this standard: MT50, MT51, MT52

## WHAT IS EN 61340-5-1?

### PROTECTION OF ELECTRONIC DEVICES FROM ELECTRONIC PHENOMENA



#### WHAT IS EN61340-5-1

Static charge can build up on the body for a number of reasons including personal attire, atmospheric humidity and the way in which a person walks and moves. A build up of electrostatic discharge (ESD) can damage sensitive electronic components or create fire risks when handling solvents and other flammable materials.

#### ESDS

In order for electrostatic sensitive devices (ESDS) to be handled with minimal risk of damage there are specific technical requirements for the design, use and control of an electrostatic protected area (EPA). This includes the use of ESD control items such as garments or footwear

#### HOW IS IT TESTED

Compliant garments must be clearly marked and must completely cover all clothing in the arms and torso region. The point to point resistance over the outer surface must be less than 1012  $\Omega$ .



#### POINT TO POINT RESISTANCE

The point to point resistance is a measure of the conductivity of the material between two points. Conductive fibres in garments work by preventing the static charge build up by allowing it to dissipate through the conductive fibres and go to earth.

#### LOWER IS BETTER

The lower the resistance the higher the conductivity and the lower the risk of electrostatic discharge.

#### PORTWEST PRODUCTS

PORTWEST RANGE OF PRODUCTS SUITABLE FOR CONTROL OF ESD ARE:  
AS10, AS11, AS20, A198, A199, FC01, FC02, FC03, FC04, FC59, FD01, FD02, FT62, FW48  
AS21, A197, A196



## WHAT IS EN 397? INDUSTRIAL HELMETS

This standard applies to protective helmets for industry where the helmet is intended to protect a static user from falling hazards. A series of impact tests must be carried out using a fixed head-form and a falling weight in order for a helmet to meet this standard.

THERE ARE FOUR COMPULSORY ELEMENTS TO EN397, IMPACT, PENETRATION, FLAMMABILITY AND ANCHORAGE



### IMPACT

The helmet must not allow more than 5Kn of energy to spread to the head after a fall of a 5kg weight from a 1 meter height. This test is performed at room temperatures of both +50 °C and -10°C.



### PENETRATION

The tip of the test mass used (3 kg from 1m height) must not come into contact with the skull. This test is performed at room temperatures of +50°C and -10°C.



### FLAMMABILITY

The helmet is exposed to a flame and it must not burn with flame emission more than 5 seconds after removal of the flame source.



### ANCHORAGE

Helmets can only protect when retained on the head. EN 397 requires that either the helmet shell or the headband is fitted with a chinstrap or with the means of attaching one, i.e. anchorage points. Chin strap (where present) shall be released at a force between 15kg e 25kg (150N -250N) – due to failure of the anchorages only. Test conducted at +50°C after the helmet being submitted to penetration test.

### CHECK YOUR DATES

In accordance with EN 397, marking of the helmet should include the year and quarter of manufacture. Period of obsolescence of the helmet and its components must be declared on the User Sheet which is delivered together with the helmet.

**ALL PORTWEST HELMETS  
HAVE A SHELF LIFE OF 7 YEARS  
FROM MANUFACTURING DATE**



## WHAT IS EN 12492?

## HELMETS FOR MOUNTAINEERS

EN 12492 is specifically used within the sporting industry for climbing helmets. Requirements for helmets to conform to the EN 12492 standard has become increasingly popular in the PPE market, as there is no specific technical standard regarding helmets for work at height. EN 12492 offers this protection. Portwest PS73 fully complies with the EN 12492 (including chin strap requirements) - this helmet is also tested for impact and penetration according to EN397, and for optional requirements of resistance at very low temperatures (-30c).



PS73

### IMPACT

When climbing or working at height, your head can be exposed to more than just top down impacts. In order to combat this the mountaineer standard EN12492 requires additional tests to the front, side and rear of our mountaineering helmets. When testing, the headform is tilted to 30° from the horizontal plane, and 5kg hemispherical and flat strikers are dropped from 2m and 500mm respectively. These tests ensure your head is fully protected from all forces greater than 10kN.

### PENETRATION

As with industrial helmets and bump caps, mountaineering helmets are intended to provide protection against sharp / pointed objects. The penetration test in EN 12492 is similar to that specified in EN 397, where a 3 kg conical striker is dropped onto the helmet from a height of 1 metre, and any contact between the helmet and headform (although in EN 12492 the headform is in the form of a standard test block) noted. Penetration tests on mountaineering helmets can be carried out on any point around the shell of the helmet, unlike EN 397 where they are restricted to an area at the crown of the head.

### DESIGN REQUIREMENTS

Most specifications for protective helmets include a number of requirements for the design of a helmet in addition to the specific performance requirements. These typically encompass the area of coverage provided by the helmet, as well as the field of vision afforded to the user when worn. They can also cover a number of ergonomics and safety-based requirements, such as clearance between the head and the shell of the helmet (particularly in the case of industrial helmets).





# DO YOU KNOW 14 CONTINUED... PORTWEST®

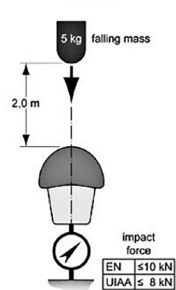
WHAT IS EN 12492 CONTINUED...

## EN 12492: 2012

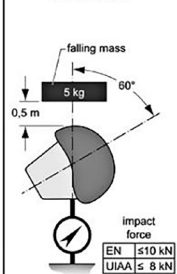
## HELMETS FOR MOUNTAINEERS

### TWO MAIN RETENTION SYSTEM TESTS:

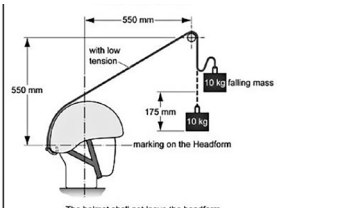
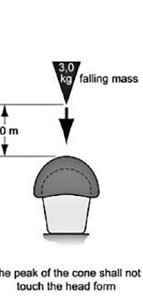
#### Energy absorption test vertical



#### Energy absorption test frontal, lateral and dorsal



#### Penetration test



#### RETENTION SYSTEM EFFECTIVENESS:

Helmets are subjected to a shock load, applied to the rear or front of the helmet in an attempt to pull the helmet off the headform. This is intended to consider the risk of the helmet catching on an obstacle and being unintentionally pulled off the user's head. The test load (applied using a 10 kg falling mass) is applied, via a system of pulleys, to the rear of the helmet when mounted on a suitable headform, with the direction of loading following a direction approximately 45° from the horizontal towards the front of the headform (this is occasionally repeated on the front of the helmet). In order to meet the requirements of most protective helmet standards, the helmet must remain on the headform.

#### RETENTION SYSTEM STRENGTH:

The retention system (in particular, the chin strap) is subjected to a force, applied either statically or dynamically, to ensure the strap is unlikely to fail at the point where it is most necessary. In the case of industrial helmets, it is however desirable that the chin strap will not cause a strangulation hazard, and so cannot be too strong, and therefore straps need to include a break-away element at the anchorages, intended to fail within a specific load range. Typically, the helmet, including chin strap, is fitted to a suitably-sized headform, with the chin strap either fitted to an artificial chin (consisting of two rollers mounted on a frame), where the headform remains static, or to the chin of the headform itself, where the headform is used to dynamically apply the force. The chin strap is then subjected to either a static force (where the artificial chin is slowly loaded until failure) or a dynamic (shock) load, applied using a falling mass, and the amount of stretch in the chin strap is measured.



PS73



## WHAT IS EN 1149-5?

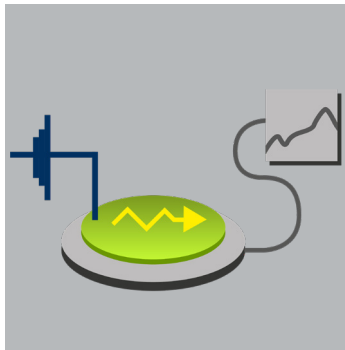


EN 1149

This European standard is part of a series of standards for test methods and requirements for electrostatic properties of protective clothing. The standard specifies material and design requirements for garments used as part of a total earthed system, to avoid incendiary discharges. The requirements may not be sufficient in oxygen enriched flammable atmospheres.

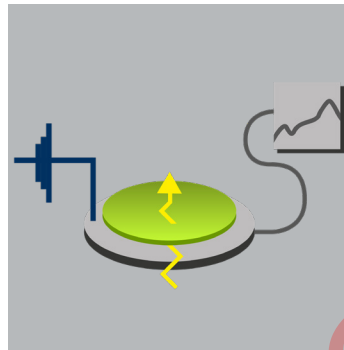
### EN 1149-5: IS A FAMILY OF STANDARDS AND INCLUDES 5 PRIMARY TEST METHODS

PLEASE NOTE - EN 1149-4: Garment Test (Is under development). The other test methods are described below.



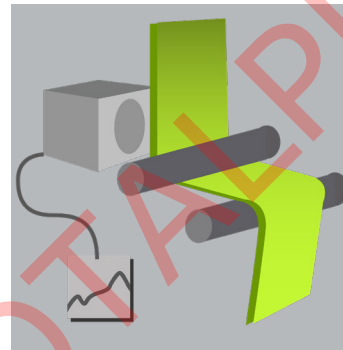
#### EN 1149-1:

Test method for measurement of surface resistivity. Surface resistance measures the conductivity between two points on the surface of a fabric. The lower the resistance the higher the conductivity, resulting in charge going to earth.



#### EN 1149-2:

Test method for measurement of the electrical resistance through a material (vertical resistance). This is the level of conductivity when measured through the depth of a fabric.



#### EN 1149-3:

Test methods for measurement of charge decay. Charge decay measures how long it takes for an electric current to dissipate. The quicker it dissipates the higher the anti-static properties of the garment.



#### EN 1149-5:

EN 1149-5 specifies the performance and design requirements to avoid static discharge for all electrostatic dissipative protective clothing as part of an entire earthed system, shoes, clothing & floor. The material meets the requirements.

## PORTWEST ANTI STATIC CLOTHING

The following ranges meet EN 1149-5.



## WHAT IS EN 14126?



EN 14126

FOR MATERIALS TO COMPLY WITH EN14126 THEY MUST ALSO UNDERGO ADDITIONAL TESTING AS FOLLOWS

### PERFORMANCE REQUIREMENTS AND TESTS METHODS FOR PROTECTIVE CLOTHING AGAINST INFECTIVE AGENTS

This standard specifies requirements and test methods for re-usable and limited use protective clothing providing protection against infective agents. Protective Clothing against infective agents; bacterial, viral and other micro-organisms has two main functions:

- To prevent infective agents from reaching the (possibly injured) skin
- To prevent the spreading of infective agents to other people and other situations, e.g. eating or drinking, when the person has taken his protective clothing off



ISO 16603

#### PENETRATION TEST USING SYNTHETIC BLOOD

This test identifies the pressurisation at which the infected synthetic blood penetrates the material. The higher the class the greater the protection of the fabric.

Class	Exposure Pressure [kPa]
6	20
5	14
4	7
3	3.5
2	1.75
1	0



ISO 16604

#### RESISTANCE TO PENETRATION BY VIRUSES

This test uses a liquid (instead of synthetic blood) contaminated with a bacteriophage or virus in order to identify the pressurisation at which the liquid penetrates through the material.

Class	Exposure Pressure [kPa]
6	20
5	14
4	7

Class	Exposure Pressure [kPa]
3	3.5
2	1.75
1	0



ISO 22611

#### RESISTANCE TO PENETRATION BY BIOLOGICALLY CONTAMINATED AEROSOLS

This test is used to assess the barrier's effect against biologically contaminated aerosols. A bacterium solution is suspended in an aerosol and sprayed on to both an unprotected cellulose nitrate membrane, and one covered with the test material. Both membranes are analysed to establish the bacterial load and the results are classified by the penetration ratio. The higher the class the greater the protection of the fabric.

Class	Penetration ratio without/ with test material [log]
3	>5
2	>2
1	>1



ISO 22610

#### RESISTANCE TO PENETRATION BY BACTERIA

This test superimposes a bacterial contaminated donor material on the test material and subjects it to mechanical rubbing. The results are recorded in accordance with breakthrough times ie: the point at which the bacteria penetrates the barrier material measured in minutes as highlighted in the table below. The longer the breakthrough time, the higher the class and therefore the greater the protection of the fabric.

Class	Bacterial Penetration [min]
6	>75
5	>60
4	>45
3	>30
2	>15
1	<15



ISO 22612

#### RESISTANCE TO PENETRATION BY CONTAMINATED DUST

A pre sterilised material is fixed in a testing apparatus and administered with contaminated talcum powder (Bacillus Subtilis). An agar plate is placed underneath the material while it is be shaken. The particles, which penetrate the material, are analysed after incubation of the agar plate and the results are measured in penetration log units as highlighted in the table below: The higher the class the greater the protection of the fabric.

Class	Penetration ratio without/ with test material [log]
3	≤ 1
2	≤ 2
1	≤ 3



## HOW TO PUT ON A HARNESS



**1.** Hold the harness up by the back dorsal D ring.

**2.** Proceed to sling the harness over the shoulders as you would a back pack.

**3.** Starting at the top, attach the chest and waist belt connections.

**4.** Reaching under each leg, grab the leg straps and wrap around each thigh and then attach to the connection points at the waist.

**5.** In order to ensure that the leg straps are tightened correctly, a fist at hand (but not a closed fist) should fit between the strap and the leg.

**6.** Finally tighten all straps to a comfortable but firm fit.



## WHAT IS EN 361?

### PERFORMANCE 24-48 REQUIREMENTS AND TESTS METHODS FOR FULL BODY HARNESSSES

EN 361 is the standard applied to Full Body Harnesses designed to hold the user in place and spread the load in the case of a fall arrest scenario (i.e. being brought to a stop following a period of free-fall).

## THERE ARE 3 MAIN PERFORMANCE TESTS IN EN361



### DYNAMIC PERFORMANCE

This test aims to simulate the behaviour of the harness in a real-life scenario by subjecting it to a shock test for a load greater than what it would experience in use. Particular focus is given to the angle at which the user is held in the event of a fall. The harness is fitted with a 100kg solid torso dummy attached to a 2 metre length of 11mm mountaineering rope connected to a solid anchorage point and dropped in free fall for 4 metres. The test is carried out twice on each harness, once from a heads-up position, once from a heads-down position (i.e. with the dummy upside down on release). In order to pass the test the harness must hold the dummy after both drops in a position not exceeding 50 degrees from the upright position.



### STRENGTH TESTS

Strength tests known as tensile tests are used to gauge the breaking strength of whole products including harnesses and lanyards. Tensile forces are usually applied for at least 3 minutes to ensure that the breaking strength of the product is in excess of the force specified by the standard. These are based on a safety factor of 6kN, where KN equals Kilonewtons a measure of force.

- Harnesses are subject to 15kN when applied in an upward direction and 10kN when applied in a downward direction.
- Lanyards are either subjected to 22kN or 15 kN applied between the attachment points depending on the materials used.



### CORROSION RESISTANCE

The aim of this test is to prove that metallic components used in fall protection equipment can withstand a minimal resistance to environmental corrosion (specifically rust). In order to prove this, metal components are placed in a sealed chamber for 24 to 48 hours and subjected to salt water mist designed to induce rust in unprotected metals. They are then examined for rust and function afterwards.

## EN 358:2000 / EN 813:2008

### WORK POSITIONING / SIT HARNESSSES

HARNESSES (OR ADDITIONAL ATTACHMENTS ON A FULL BODY HARNESS) INTENDED FOR USE WHERE FREE-FALL IS NOT USED – IN PARTICULAR, WORK POSITIONING / RESTRAINT AND FOR USE IN ABSEILING OR ROPE ACCESS.



#### DYNAMIC PERFORMANCE

As with full body harnesses, work positioning and sit / abseil harnesses are subjected to a drop test to generate a shock load on the harness. However, commensurate with the end use, a lesser force is applied to the harness as the possibility of a period of free-fall is significantly less in use. Work positioning attachments are subjected to a 1 metre drop with a 1 metre length of rope, whereas sit harnesses are dropped over a distance of 2 metres with a 1 metre length of rope. In both cases, the harness is required only to safely arrest the fall of the test dummy following the drop.



#### STATIC STRENGTH

Whole products are subjected to tensile tests. Belts, harnesses and lanyards are subject to a 15kN tensile force. Tensile forces are applied and held for at least 3 minutes, to ensure the breaking strength of the product is in excess of the force specified by the standard.



#### CORROSION RESISTANCE

Metallic components used in fall protection equipment are subjected to a neutral salt-spray test intended to prove a minimum resistance to environmental corrosion (specifically rust). Products are held within a sealed chamber, which is filled with a salt-water mist, which can induce rust in unprotected metals. Products are subjected to either 24 or 48 hours exposure and examined for rusting and function afterward.



## WHAT IS EN 355?

### PERFORMANCE REQUIREMENTS AND TEST METHODS FOR SHOCK ABSORBING LANYARDS

EN355 RELATES TO LANYARDS INTENDED FOR USE IN CONNECTING THE ATTACHMENT POINT OF A FULL BODY HARNESS TO A SUITABLE ANCHORAGE DEVICE. THE LANYARD INCLUDES A SHOCK ABSORBING ELEMENT, INTENDED TO REDUCE THE FORCE APPLIED TO THE USER BY GRADUALLY ARRESTING THE FALL.

## THERE ARE 3 MAIN PERFORMANCE TESTS IN EN355



### DYNAMIC PERFORMANCE

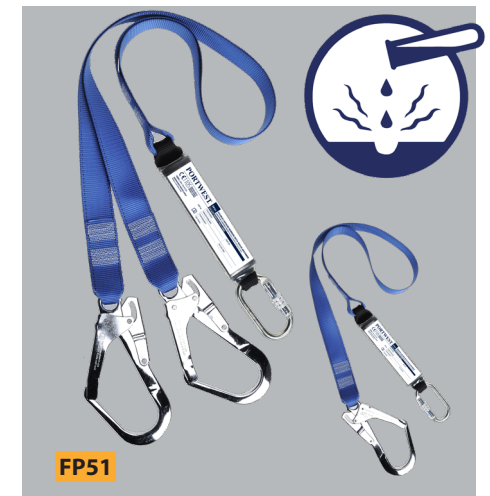
Shock absorbing lanyards are subject to a drop test, intended to assess the performance of the lanyard in terms of its ability to arrest a fall within a maximum distance, whilst maintaining the force to a suitable maximum. In particular, the lanyard should not deploy (stretch, open, tear) beyond a maximum length of 1.75 metres, with a maximum force of 6 kN, following a fall using a minimum solid mass of 100 kg, dropped over a distance of twice the length of the lanyard.

Where energy absorbers are intended to be sold separately to the lanyard (i.e. as a component), they are extended with chain to a length of 2 metres, with the mass dropped over a distance of 4 metres.



### STATIC STRENGTH

Whole products are subjected to tensile tests. Energy absorbers are subject to a 15 kN tensile force. Tensile forces are applied and held for at least 3 minutes, to ensure the breaking strength of the product is in excess of the force specified by the standard.



### CORROSION RESISTANCE

Metallic components used in fall protection equipment are subjected to a neutral salt-spray test intended to prove a minimum resistance to environmental corrosion (specifically rust). Products are held within a sealed chamber, which is filled with a salt-water mist, which can induce rust in unprotected metals. Products are subjected to either 24 or 48 hours exposure and examined for rusting and function afterward.

## WHAT IS EN 795?

### PERFORMANCE REQUIREMENTS AND TEST METHODS FOR ANCHOR DEVICES

EN795 RELATES TO DEVICES INTENDED TO FORM THE INTERFACE BETWEEN THE FALL ARREST SYSTEM (HARNESSES, LANYARDS, RETRACTABLE LANYARDS ETC.) AND THE STRUCTURE. THESE CAN BE IN THE FORM OF SINGLE BOLTS, SLINGS, DEADWEIGHT DEVICES OR ANCHOR SYSTEMS (RAILS OR CABLES).

### THERE ARE 3 MAIN PERFORMANCE TESTS IN EN795:



#### DYNAMIC PERFORMANCE

Anchor devices are subject to a series of drop tests carried out on the device used as intended, in every intended direction of use. This can often mean a series of tests with the device fitted to a number of different substrates. This can often mean testing on a very large scale, as devices need to be installed as it would be used (often tested to sample roof surfaces or structures). The tests required are dependant on the class of the device.



#### STATIC STRENGTH

Whole anchor products are subjected to tensile tests. These forces are usually between 12 kN and 18 kN depending on the type of anchor device. Tensile forces are applied and held for at least 3 minutes, to ensure the breaking strength of the product is in excess of the force specified by the standard.



#### CORROSION RESISTANCE

Metallic components used in fall protection equipment are subjected to a neutral salt-spray test intended to prove a minimum resistance to environmental corrosion (specially rust). Products are held within a sealed chamber, which is fitted with a salt-water mist, which can induce rust in unprotected metals. Products are subjected to two periods each of 24 hours exposure, separated by a 1 hour drying period, and examined for rusting and function afterward.



## WHAT IS EN 360?

EN360 RELATES TO DEVICES WHICH CONTAIN A LANYARD FOR ATTACHMENT BETWEEN A FULL BODY HARNESS AND A SUITABLE ANCHORAGE DEVICE. IN THESE DEVICES, THE LANYARD WILL RETRACT (UNDER A SPRING LOADED MECHANISM) BACK ONTO A DRUM IN THE CASING OF THE DEVICE. IN THE CASE OF A FALL, A BRAKING DEVICE (OR SIMILAR) WILL CAUSE THE DRUM TO LOCK, ARRESTING THE FALL OF THE USER IN AS SHORT A DISTANCE AS POSSIBLE.

### PERFORMANCE REQUIREMENTS AND TEST METHODS FOR FALL ARREST BLOCKS/ RETRACTABLE LIFELINES

## THERE ARE 4 MAIN PERFORMANCE TESTS IN EN360



FP40



### DYNAMIC PERFORMANCE

Retractable lanyards are subject to a drop test similar to that used for lanyards (using a solid 100 kg test mass, measuring arrest distance and arrest force). However, the drop height for this test is fixed at 600 mm, irrespective of the total length of the device. A clip is applied to the lanyard at 600 mm to prevent it being retracted back into the case, and allow a clear freefall. The lanyard should not deploy beyond a maximum length of 1.4 metres (essentially arresting the fall within 2 metres from the point of release), with a maximum arrest force of 6 kN.



### LOCKING AFTER CONDITIONING

In the case of mechanical devices, additional testing is required to ensure they are not adversely affected by environmental conditions. Devices are checked for their locking function (by dropping a mass of at least 5 kg) following conditioning to high temperature (50°C, 85 % relative humidity for at least 2 hours), low temperature (-30°C for at least 2 hours) and water (sprayed at 70 litres per hour for at least 3 hours). Optional testing following submersion in diesel oil or dust can also be included.



### CORROSION RESISTANCE

Metallic components used in fall protection equipment are subjected to a neutral salt-spray test intended to prove a minimum resistance to environmental corrosion (specifically rust). Products are held within a sealed chamber, which is filled with a salt-water mist, which can induce rust in unprotected metals. Products are subjected to either 24 or 48 hours exposure and examined for rusting and function afterward.



### STATIC STRENGTH

Whole products are subjected to tensile tests. Textile lanyards are subject to a 15 kN tensile force and metal to 12 kN. Tensile forces are applied and held for at least 3 minutes, to ensure the breaking strength of the product is in excess of the force specified by the standard.

SOURCE: <http://www.satrappeguide.com/EN360.php>

## WHAT IS EN 362?

### PERFORMANCE REQUIREMENTS AND TEST METHODS FOR CONNECTORS

SYSTEMS MADE UP OF A LINE INTENDED TO BE FIXED (EITHER TEMPORARILY OR PERMANENTLY) TO A STRUCTURE AT THE TOP ONLY, ON WHICH A TRAVELLING DEVICE IS ATTACHED. THE USER CONNECTS TO THIS TRAVELLING DEVICE WHEN CLIMBING OR DESCENDING – IN THE CASE OF A FALL, THE TRAVELLING DEVICE SHOULD GRIP THE LINE AND ARREST THE FALL.

### THERE ARE 2 MAIN PERFORMANCE TESTS IN EN362:



#### STATIC STRENGTH

Connectors are subject to a range of tensile strength tests, applied in several directions, depending on the type of connector. Where a connector has only one possible direction of loading (e.g. where one end of the connector is permanently attached to another component), loading is applied in only one direction. However, where foreseeable misuse could result in loading being applied in directions other than the 'main' direction, testing is required in both the major (length) axis and minor (width) axis. In addition, where connectors do not automatically lock on closure, testing is carried out with gate both locked and unlocked.

In the case of EN 362, tensile loads are applied and held for 3 minutes, whereas in EN 12275, the load is increased to the point where breakage occurs. Therefore, it is important when comparing products, to be aware of which standard the connector has been tested to.



#### CORROSION RESISTANCE

Metallic components used in fall protection equipment are subjected to a neutral salt-spray test intended to prove a minimum resistance to environmental corrosion (specially rust). Products are held within a sealed chamber, which is filled with a salt-water mist, which can induce rust in unprotected metals. Products are subjected to either 24 or 48 hours exposure and examined for rusting and function afterward.

## WHAT IS EN EN 353-2:2002? PERFORMANCE REQUIREMENTS AND TEST METHODS FOR GUIDED TYPE FALL ARRESTERS

EN353-2 RELATES TO SYSTEMS MADE UP OF A LINE INTENDED TO BE XED (EITHER TEMPORARILY OR PERMANENTLY) TO A STRUCTURE AT THE TOP ONLY, ON WHICH A TRAVELLING DEVICE IS ATTACHED. THE USER CONNECTS TO THIS TRAVELLING DEVICE WHEN CLIMBING OR DESCENDING – IN THE CASE OF A FALL, THE TRAVELLING DEVICE SHOULD GRIP THE LINE AND ARREST THE FALL.

### THERE ARE 4 MAIN PERFORMANCE TESTS IN EN353-2



#### DYNAMIC PERFORMANCE

Guided type fall arresters are subject to a drop test using a 100 kg mass, dropped over the maximum distance the device will allow – essentially by raising the mass until the travelling device begins to slide up the cable or rail. The device should not deploy more (by movement of the travelling device, stretch in the rope or deployment of energy absorbing elements) beyond a maximum length of 1 metre, with a maximum arrest force of 6 kN.



#### LOCKING AFTER CONDITIONING

In the case of mechanical devices, additional testing is required to ensure they are not adversely affected by environmental conditions. Devices are checked for their locking function (by dropping a mass of at least 5 kg) following conditioning to high temperature (50°C, 85 % relative humidity for at least 2 hours), low temperature (-30°C for at least 2 hours) and water (sprayed at 70 litres per hour for at least 3 hours). Optional testing following submersion in diesel oil or dust can also be included.



#### CORROSION RESISTANCE

Metallic components used in fall protection equipment are subjected to a neutral salt-spray test intended to prove a minimum resistance to environmental corrosion (specifically rust). Products are held within a sealed chamber, which is filled with a salt-water mist, which can induce rust in unprotected metals. Products are subjected to either 24 or 48 hours exposure and examined for rusting and function afterward.



#### STATIC STRENGTH

Whole products are subjected to tensile tests. Textile lanyards are subject to a 15 kN tensile force and metal to 12 kN. Tensile forces are applied and held for at least 3 minutes, to ensure the breaking strength of the product is in excess of the force specified by the standard.

## WHAT IS EN 166?

EN166 is the core technical standard which applies to all safety eyewear including spectacles, goggles and visors. It does not apply to eye protection for which separate standards exist (anti-laser eye protection, sunglasses for general use).

The main tests on this standard are: **Optical Requirements and Mechanical Protection/Impact Resistance**



### 1: OPTICAL REQUIREMENTS

Tests include, transmission and diffusion of light, refractive properties, resistance to aging (stability to heat and resistance to UV), corrosion and ignition. Results of the testing define the Optical Class of the eye protector: which falls into 1 of 3 categories, where 1 is the highest and 3 is the lowest as indicated in the table. These categories define the quality of the lens in terms of how much or how little distortion is experienced by the wearer.

Tolerance Of The Optical Power	Optical Class	Application
± 0.06 Dioptres	1	Work all the Time (Distortion free)
± 0.12 Dioptres	2	Work occasionally
± 0.25 Dioptres	3	Work briefly

### 2: MECHANICAL PROTECTION/IMPACT RESISTANCE

This test (applicable to both lens and frame) determines the impact resistance of the eyeprotector (spectacles, goggles or visors) to withstand flying objects without cracking or shattering. The test is performed with steel balls of different diameters and weights which are used to strike the lens and frame at different speeds as indicated in the table. This results in 4 levels of mechanical protection denoted by the markings; 'S', 'F' or 'A' on the eye protector where 'S' is the lowest grade, offering the least amount of protection and 'A' is the highest grade offering maximum protection under the standard.

**Note: spectacles can only get a S or F marking, goggles can have a S, F or B whereas grade A is applicable to visors only.**

MARKING	MECHANICAL PROTECTION	TESTS DETAILS	Possible On		
S	Minimal impact resistance	22 mm diameter steel ball at a speed of 5,1 m/sec			
F	Low energy impact	6 mm diameter steel ball at a speed of 45 m/sec			
B	Medium energy impact	6 mm diameter steel ball at a speed of 120 m/sec			
A	High energy impact	6 mm diameter steel ball at a speed of 190 m/sec			

### OPTIONAL REQUIREMENTS

EN 166 also describes other optional tests which must be applied should the manufacturer wish to make additional claims regarding protection. For example the Impact Resistance Against High Speed Spectacles At Extreme Temperature is conducted on spectacles/goggles and visors conditioned at extreme temperatures from -5°C /+55°C, resulting in similar markings as the above table, with a T denoting temperature: FT/ BT / AT. Note: This does not apply to the S marking category.

### OTHER OPTIONAL REQUIREMENTS

and corresponding markings for EN166 are described in the table below.

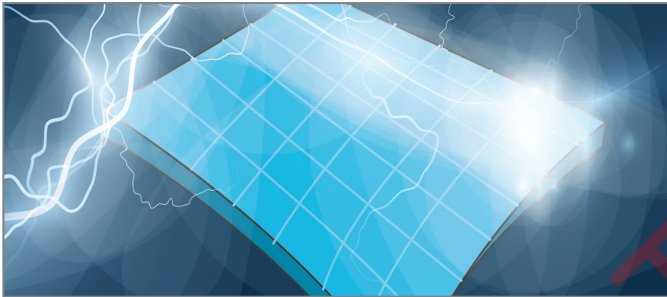
MARKING	TYPE OF PROTECTION	TEST - Resistance against	Possible On		
3	CHEMICAL RISK	Liquids (droplets and splashes)			
3	CHEMICAL RISK	Resistance to projections			
4	CHEMICAL RISK	Coarse dust particles (particle with > 5µm grain size)			
5	CHEMICAL RISK	Gas, vapours, mist, smoke and fine dust particles (with < 5µm grain size)			
8	ELECTRICAL RISK	Short circuit arc resistance			
9	THERMAL RISK	Molten Metal splashes and Hot solids projections			
K	LENS TREATMENT	Resistance to surface damage by fine particles (anti-scratch treatment)			
N	LENS TREATMENT	resistance to foggy (anti-fog treatment)			



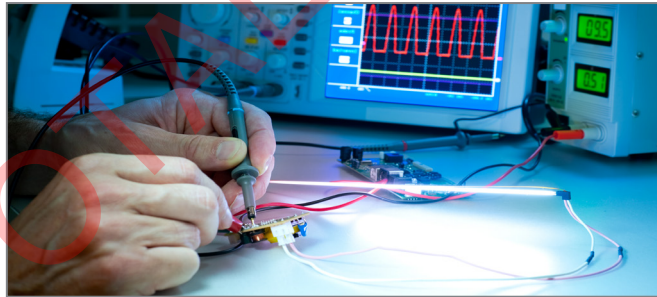
## THE DIFFERENCE BETWEEN ANTISTATIC & ESD FOOTWEAR

Electrical resistance is an important characteristic of safety shoes. Movement and friction causes a build up of electrostatic charge in the body. Shoes and clothing that are not conductive enough can increase this charge. At a certain point a discharge will occur. A discharge that is too high or uncontrolled can result in serious consequences such as an explosion due to spark formation or damage to electronic products and components in a working environment.

### ANTI- STATIC FOOTWEAR VS. ESD (ELECTROSTATIC DISSIPATIVE)



**1.** Anti-static footwear protects the user from medium levels of electricity that could cause serious injury whereas ESD footwear protects the product i.e. electronic devices and circuitry from a build up of static that can cause damage.



**2.** Anti-static footwear can be worn in many different work environments whereas ESD footwear is ideally suited for the electronics industry, laboratories and other work places where delicate, electronic components are used.



**3.** Anti-static shoes have an electrical resistance between 0.1 and 1000 MegaOhm ( $M\Omega$ ), measured according to EN 20344: 2011 whereas ESD have an extremely low electrical resistance between 0.1 and  $100M\Omega$



EN 407

## WHAT IS EN 407?

### PROTECTIVE GLOVES AGAINST THERMAL RISKS

The EN407 heat and flame pictogram is accompanied by a 6 digit number. This 6 digit number identifies the performance levels (1-4) which a glove can achieve for each of the tests within the standard. The higher the performance level, the greater the protection of the glove against a range of thermal risks as described below:

1 3 1 2 1 2

#### F - RESISTANCE TO LARGE SPLASHES OF MOLTEN METAL

Measures the amount of molten iron (in grams) required to cause damage to "simulated skin" placed inside the glove.

#### E - RESISTANCE TO SMALL SPLASHES OF MOLTEN METAL

Measures the specific amount of molten droplets (from a melted metal rod), required to raise the inside temperature of a glove by 40c.

#### D - RESISTANCE TO RADIANT HEAT

Measures the ability of a glove to resist heat from a radiant heat source.

#### C - RESISTANCE TO CONVECTIVE HEAT

Measures the ability of a glove to resist heat from a flame source.

#### B - RESISTANCE TO CONTACT HEAT

Measures the ability of a glove to resist heat when placed in direct contact with a heated object or hot surface.

#### A - RESISTANCE TO FLAMMABILITY

Measures how likely a glove is to catch fire after a flame is applied.

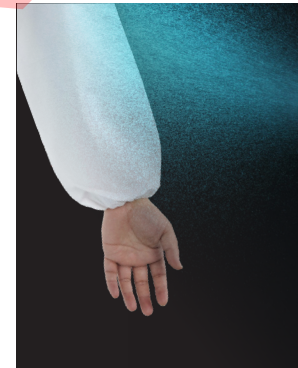
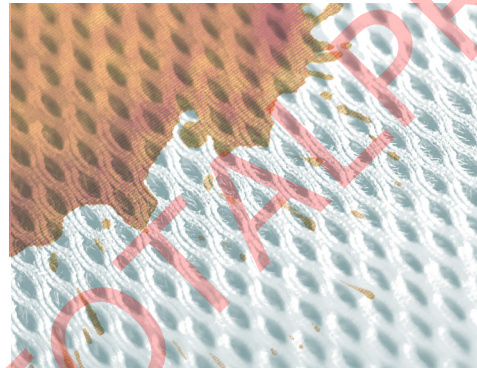


## EN 13034 WHAT IS THE DIFFERENCE BETWEEN TYPE 6 AND TYPE PB [6] CHEMICAL PROTECTION?



EN 13034

EN 13034 specifies the performance requirements for disposable and re-usable limited performance chemical protective clothing (Type 6 and (Type PB [6]) garments. Limited performance chemical protective clothing (disposable and re-usable) is intended for use in cases of a potential exposure to a light spray, liquid aerosols, low volume splashes and in circumstances where a complete barrier to chemical exposure is not required.



In order to ensure that a chemical protective suit meets Type 6 protection, it is tested using a mist or fine spray of water. The water is dosed with a mild detergent to produce a specified surface tension and injected with a dye to aid the assessment of leakage. The test subject wears an absorbent suit underneath the one to be tested, which absorbs any leaks and is stained by the dye. Success or failure is determined by measuring the total area of any stains on three suits and comparing this with the requirement. Leaks will typically occur at closures and interface areas, but the liquid can also seep through the material itself.

Type PB [6] testing is conducted in a similar way to the Type 6 suit test but only on partial body garments such as sleeves, aprons coats etc.



### TYPE 6 VS. TYPE PB [6]

The standard covers both chemical protective suits (Type 6) and partial body protection (Type PB [6])

**CHEMICAL PROTECTIVE SUITS (TYPE 6)** cover and protect at least the trunk and the limbs, e.g. one piece coveralls or two piece suits with or without hood, boot-socks or boot covers.

**PARTIAL BODY PROTECTION** of similar limited performance Type PB [6] covers and protects only specific parts of the body, e.g. coats, aprons, sleeves etc.



## WHAT IS EN ISO 13287:2019? SLIP RESISTANCE

This standard specifies a method for testing the slip resistance of conventionally soled safety footwear. It is not applicable to footwear with specific features such as studs or spikes or footwear that is designed for soft ground such as sand and sludge.

Normal Force

Normal Force



Forward Heel Slip

Forward Flat Slip

### EN ISO 13287:2019

Marking Code	Test Surface	Coefficient of Friction (EN 13287)	
		Forward Heel Slip	Forward Flat Slip
SRA	Ceramic tile with SLS*	< 0.28	< 0.32
SRB	Steel floor with Glycerol	< 0.13	< 0.18
SRC	Ceramic tile with SLS* & Steel floor with Glycerol	< 0.28 < 0.13	< 0.32 < 0.18

\*Water with 5% Sodium Lauryl Sulphate (SLS) solution

### 1. SRA

SRA graded footwear is tested on a ceramic tile floor upon which a solution called sodium Lauryl sulphate (NaLS) is applied. This solution acts as a lubricant to gauge the slip resistance of the footwear in slippery conditions. The slip resistance is determined based on the frictional force of the item of footwear i.e. its ability to resist slipping over the surface. The results are expressed as the dynamic coefficient of friction.

### 2. SRB

SRB graded footwear follows a similar test method as the SRA test described above but the test is performed on a steel floor with glycerol.

### 3. SRC

SRC graded footwear is the marking given to an item of footwear if the outsole passes both the ceramic tile test (SRA) and the steel floor test (SRB).



## WHAT IS 10819? Mechanical Vibration & Shock



**EN ISO 10819 IS THE STANDARD WHICH SPECIFIES THE REQUIREMENTS FOR GLOVES TO PROTECT AGAINST VIBRATIONS.**

When working with any equipment producing vibration exposure such as jackhammers, chipping & paving breaker tools, electric hammers etc, users will experience vibration transmission from the tool handle to the palms of the hands hence the reason for wearing anti vibration gloves. EN ISO 10819 sets out the requirements used to analyse the 'vibration transmissibility' of gloves i.e. the ability of a glove to protect the users' hands from vibrations within a frequency range of 31.5 Hz to 1250 Hz.



The standard further stipulates that within this frequency range there are 2 classifications which measure the performance of Anti Vibration gloves; 'Medium Frequency' and 'High Frequency' consistent with the range parameters defined below:

**TR<sub>M</sub>: TRANSMISSIBILITY MEDIUM (M) 31.5 HZ – 200 HZ**

**TR<sub>H</sub>: TRANSMISSIBILITY HIGH (H) 200 HZ – 1250 HZ**

In order for a glove to comply with the requirements of EN ISO 10819, it must satisfy both the medium and high frequency requirements as outlined below.

### MEDIUM FREQUENCY RANGE ))

When the glove is tested in the medium range, the standard clearly stipulates that the glove must not amplify the vibrations – i.e. the TR<sub>M</sub> has to be  $\leq 1.0$  in order for the glove to pass the standard.

### HIGH FREQUENCY RANGE ))

When the glove is tested in the High frequency range the glove must reduce vibration levels by at least 40% i.e. the TR<sub>H</sub> has to be  $\leq 0.6$  in order for the glove to pass the standard.

## WHAT IS EN ISO 11612?



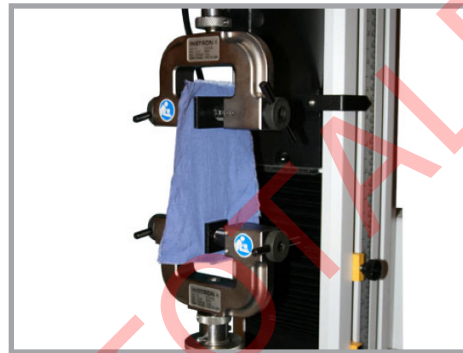
EN ISO 11612

**EN ISO 11612** is the standard for protective clothing which protects against heat and flame. Users for these garments include those who work in oil & gas, welding & allied processes, mining, petroleum and many other industries.

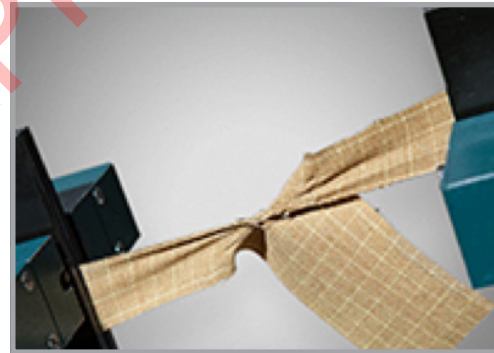
**THERE ARE A HOST OF SPECIFIC TESTS CONDUCTED AS PART OF EN ISO 11612 INCLUDING TESTS FOR:**



**Flame Spread Test:** A flame is held against the fabric for ten seconds. After it is removed the fabric should not continue to burn. There should be no hole formation, melting or molten debris.



**Tensile Strength Test:** The fabric must be able to withstand a minimum force of 300 newtons while being stretched or grabbed.



**Tear Resistance Test:** The fabric must be able to withstand a minimum force of 10 newtons before it will tear.



**Heat Resistance Test:** The fabric is placed in an oven at 180°C and must not ignite melt or shrink within the first 5 minutes in order to comply with the standard.

**PORTWEST HAS OVER 91 FR STYLES CERTIFIED TO EN ISO 11612 STANDARD**



## WHAT IS EN ISO 20345?

This is the European standard relating to safety footwear used for general purposes.

THERE ARE A HOST OF SPECIFIC TESTS CONDUCTED AS PART OF EN ISO 20345 INCLUDING :

### Impact Resistance:

A steel weight of 20kg is adapted to fall freely on top of the footwear sample in order to assess the strength of the toe cap. After impact the distance between the toe cap and the insole must range between 12.5 –15mm.



### Compression Resistance:

The footwear sample is subjected to a force of 15kN between two steel plates. Upon completion of the test the distance between the toe cap and the insole must range between 12.5 –15mm.



### Anti-Penetration Insert:

A force of at least 1100N is applied to a test nail. In order to meet the standard, the tip of the nail must not protrude through the midsole of the footwear sample. A visual inspection is carried out to verify this.



## WHAT IS BS7959? FOR SPILL MATERIALS USED FOR THE CONTROL OF LIQUID SPILLAGES.

**BS7959 IS THE BRITISH STANDARD, WHICH CONTAINS 3 PARTS FOR SPILL CONTROL PRODUCTS: ABSORBENCY, OIL ONLY SORBENTS AND COLOUR CODING FOR SPILL.**



### **BS 7959-1:2004:**

#### **Part 1: Determination of Sorbency**

This tests the absorbency rate for a variety of different sorbents i.e. pads, socks, pillows etc. using diesel fuel, hydraulic oil, motor oil, xylene, deionized water. The absorbency is measured in litres of liquid absorbed per Kg. After 30 seconds if the sorbent has retained the liquid it passes the standard.



### **BS 7959-2:2000:**

#### **Part 2: Determination of water repellency or buoyancy for hydrophobic (oil sorbent) materials**

This test is performed in the same manner as part 1, however it only measures the absorbency for oil only sorbents.

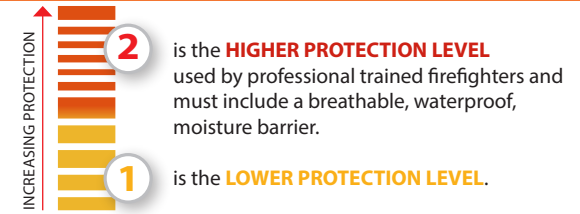


### **BS 7959-3:2007:**

#### **Part 3: Colour coding of sorbent materials**

All sorbents are categorised using different colours according to their industrial application: Oil Only sorbents are white or blue and are used with oils, hydrocarbons and liquids which do not mix with or absorb water. Maintenance sorbents are grey and are used with most liquids that do not degrade the sorbent. Chemical sorbents are yellow and are used with most aggressive chemical liquids

## WHAT IS EN469?



**EN469 IS THE EUROPEAN STANDARD RELATING TO PROTECTIVE CLOTHING FOR FIREFIGHTERS.**  
**WITHIN THE STANDARD THERE ARE 2 LEVELS AND A NUMBER OF PHYSICAL TESTS AS DESCRIBED BELOW:**



1 2  
Xf1 or Xf2  
Xr1 or Xr2  
Y1 or Y2  
Z1 or Z2



Level 1 or Level 2

**Level 1** is the lower protection level.  
**Level 2** is the higher protection level used by professional trained firefighters and must include a breathable, waterproof, moisture barrier.

Xf1 or Xf 2 refers to Convective Heat Transfer  
Xr1 and Xr 2 refers to Radiant Heat Transfer  
Y1 or Y 2 refers to Water Penetration Resistance  
Z1 or Z 2 refers to Water Vapour Resistance.



### Convective Heat Transfer - Xf1 or Xf 2

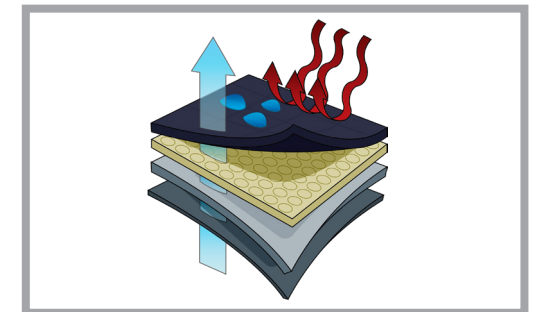
This test measures the time taken to raise the temperature of the fabric based on convective heat passing from the outer to the inner surface e.g. steam.

Convected heat travels through the air, even if there is no immediate appearance of fire.



### Radiant Heat Transfer - Xr1 or Xr2

This test measures the time taken to raise the temperature of the fabric based on heat from a radiant heat source e.g. burning flames or hot objects passing from the outer to the inner surface. Radiant heat is sensitive to the colour of the garment e.g. a lighter coloured fire suit will offer higher radiant protection than a dark coloured suit.



### Water Penetration Resistance -Y1 or Y2 Water Vapour Resistance - Z1 or Z2

These tests measure the level (1 or 2) of protection offered against the transfer of water droplets and the breathability of the fabric. The waterproof and breathability aspects will ensure the inner layer is kept dry, slowing down the transfer of heat from the outer to the inner layer that could result in giving the wearer a burn.

**PORTWEST HAS 2 PRODUCTS CERTIFIED TO EN469. ALL FIRE SUITS ARE CERTIFIED TO LEVEL 2**



## WHAT IS EN149?

EN 149:2001- A1:2009 IS THE EUROPEAN STANDARD THAT COVERS THE TECHNICAL SPECIFICATIONS FOR RESPIRATORY PROTECTIVE DEVICES - FILTERING HALF MASKS TO PROTECT AGAINST PARTICLES

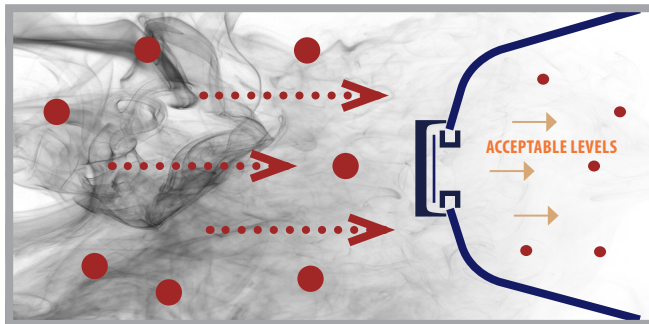
There are 3 classes of masks as defined by the standard:

FFP1 = Lowest class of protection

FFP2 = Higher class of protection

FFP3 = Highest level of protection

HERE ARE THE 3 MANDATORY TESTS CONDUCTED UNDER THE STANDARD:



### 1. TOTAL INWARD LEAKAGE

This test measures the probability of the respiratory mask to protect the wearer against potential hazards.

A test subject wearing the particle mask walks in an enclosed test room, with a constant concentration of sodium chloride aerosol. While the subject breathes, the air inside the mask is sampled and analysed to determine which % of sodium chloride could pass through the mask.

INWARD LEAKAGE %	
FFP1	Not greater than 22%
FFP2	Not greater than 8%
FFP3	Not greater than 2%

*The lower the percentage the higher the protection*



### 2. PENETRATION OF FILTER MATERIAL

The goal of this test is to measure the filtering power of the masks.

This test is carried out by exposing a dummy head with a mask to 120mg of 2 test aerosols (Sodium chloride & Paraffin oil). The standard defines the maximum admitted penetration % of the 2 aerosols, for FFP1/FFP2 and FFP3 masks.

CLASS	PENETRATION LEVEL %	
	SODIUM CHLORIDE	PARAFFIN OIL
FFP1	20%	20%
FFP2	6%	6%
FFP3	1%	1%

*The higher the penetration levels the lower the protection*



### 3. BREATHING RESISTANCE

This test assesses the ability of the filtering mask to provide protection while allowing the wearer to breathe easily.

CLASS	BREATHING RESISTANCE - mbar		
	INHALATION 30 l/MIN	95 l/MIN	EXHALATION 160 l/MIN
FFP1	0.6	2.1	3.0
FFP2	0.7	2.4	3.0
FFP3	1.0	3.0	3.0

*The permitted resistance is lower for FFP1 because it's a lighter mask and it's higher for FFP2 and FFP3 as they are thicker.*



## WHAT IS EN 511?

## PROTECTIVE GLOVES AGAINST COLD

EN511:2006 IS THE EUROPEAN STANDARD SPECIFYING THE REQUIREMENTS AND TEST METHODS FOR GLOVES WHICH PROTECT AGAINST CONDUCTIVE COLD DOWN TO -50 DEGREES CELSIUS. THIS COLD CAN BE LINKED TO CLIMATE CONDITIONS OR AN INDUSTRIAL ACTIVITY.

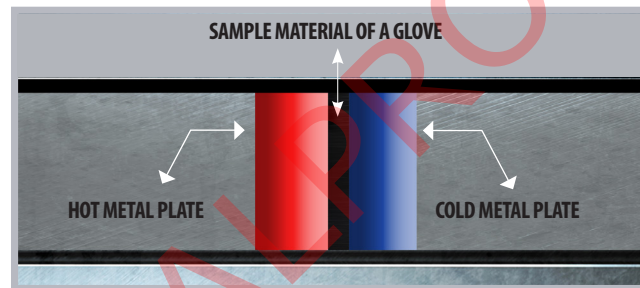
### EN 511 HAS 3 PERFORMANCE TESTS:



#### A. CONVECTIVE COLD

A glove is placed on a hand model which is heated between 30-35 degrees Celsius in a test chamber. The amount of energy required to maintain this heat determines the performance level of the glove. This is calculated by applying a specific formula known as the resultant thermal insulation formula or (ITR) as outlined in the table below. There are 4 performance levels overall. The higher the performance level the greater the insulation properties of the glove.

Performance Level	Thermal insulation (ITR) in m <sup>2</sup> K/W
1	$0,10 \leq \text{ITR} < 0,15$
2	$0,15 \leq \text{ITR} < 0,22$
3	$0,22 \leq \text{ITR} < 0,33$
4	$0,33 \leq \text{ITR}$



#### B. CONTACT COLD

A sample material of a glove is placed into a test chamber between 2 metal plates, one heated and one cold. A Thermal Resistance (R) formula measures the temperature drop across the test sample which is then compared to that of a control sample (non thermal material) in order to calculate its thermal resistance. There are 4 levels ranging from 1-4, the higher the thermal resistance the greater the insulating capacity of the glove to insulate against cold.

Performance Level	Thermal Resistance R in m <sup>2</sup> K/W
1	$0,025 \leq R < 0,050$
2	$0,050 \leq R < 0,100$
3	$0,100 \leq R < 0,150$
4	$0,150 \leq R$



#### C. WATER PENETRATION

The Water Penetration test or water Impermeability test is a straight forward test based on a pass/fail basis. The glove sample is submerged into water, if after 30 minutes no water has managed to penetrate the glove then it is deemed to have passed the test, otherwise it is classed as a fail.

The results are indicated by either 0 or 1.

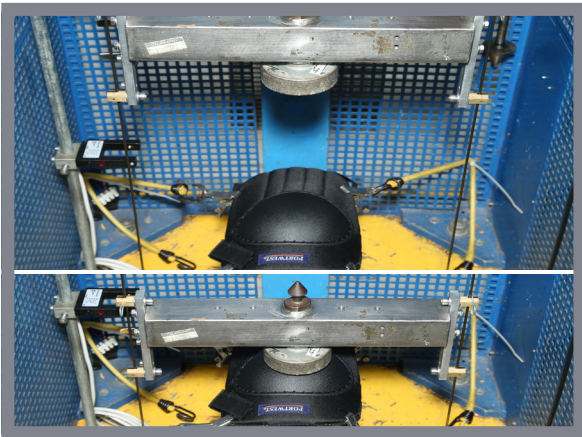
Result	Duration of test
0 = Fail	Water penetration before 30 minutes.
1 = Pass	No water Penetration before 30 minutes.

22 PORTWEST STYLES ARE TESTED TO THE EN 511 STANDARD

## WHAT IS EN14404?

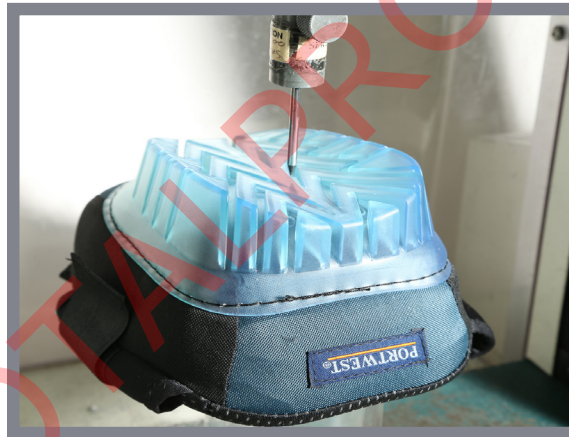
This is the European standard which specifies the performance requirements for kneepads.

Here are 3 examples of specific tests conducted as part of the standard.



### SHOCK ABSORPTION TEST

This test aims to simulate kneeling several times in quick succession. It involves a machine using a force of five joules of energy which strikes various parts of the knee pad five times within five minutes. The transmitted force (i.e. the residual impact not absorbed by the kneepad) is measured in Kn. In order for the kneepad to pass, the mean average of the 5 tests cannot exceed 3Kn and no single measurement can exceed 4Kn.



### PENETRATION RESISTANCE TEST

This test is used to assess the performance level of a kneepad to protect the knee against objects. In order to pass the test, the internal surface of the kneepads must not deflect by more than 5mm when a particular level of force is applied.

FORCE APPLIED	DEFLECTION	LEVEL
100N	> 5mm	0
100N	< or = 5mm	1
250N	< or = 5mm	2



### RESTRAINT TESTING

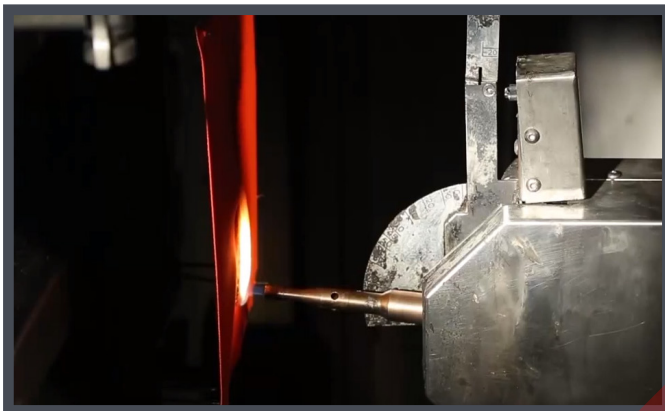
This test is used to gauge how well the kneepads stay in position during use. This test is solely for Type 1 strap on kneepads. The straps must have a maximum width of 30mm and cannot stretch more than 40mm when a force of 10N is applied. This is to ensure that they stay in position and that they are not overly constrictive causing discomfort to the user. A type 1 kneepad is deemed to pass the restraint test based on feedback collated from test subjects.

PORTWEST HAS 7 STYLES (KP55, KP44, S156, KP50, KP40, KP30 & KP20) CERTIFIED TO EN14404

## WHAT IS EN ISO 14116 PROTECTIVE CLOTHING AGAINST LIMITED FLAME SPREAD MATERIALS

THIS INTERNATIONAL STANDARD SPECIFIES THE PERFORMANCE REQUIREMENTS FOR THE LIMITED FLAME SPREAD PROPERTIES OF MATERIALS AND PROTECTIVE CLOTHING INTENDED TO PROTECT WORKERS AGAINST OCCASIONAL BRIEF CONTACT WITH SMALL FLAMES.

There are 3 indices for limited flame spread protection under the standard. Depending on how the fabric performs during the test determines the index or level of protection.



### EN ISO 14116 TESTING EQUIPMENT

A specialist test rig is used for testing flame standards on materials under laboratory conditions. A small flame is applied to a fabric sample for 10 seconds and then removed. The condition of the fabric is then examined.

### INDICES FOR LIMITED FLAME SPREAD PROTECTION

#### INDEX 1

#### THE LOWEST LEVEL OF PROTECTION

The flame does not spread, there are no flaming debris, no afterglow but a hole may be formed

#### INDEX 2

#### A HIGHER LEVEL OF PROTECTION

The flame does not spread, there are no flaming debris, no afterglow and there will be no hole formation.

#### INDEX 3

#### THE HIGHEST LEVEL OF PROTECTION

At this level the flame does not spread, there are no flaming debris, no afterglow, no hole formation and it also specifies that the afterflame time for each individual sample garment is less than 2 seconds.

**FR41** is certified to EN ISO 14116 and is designed to offer full protection against adverse weather conditions and flame hazards.



PORTWEST HAS OVER 20 STYLES WHICH ARE TESTED TO AND EXCEED THE EN14116 STANDARD

## WHAT IS EN136?

### European standard for Full Face Masks - Respiratory protective devices

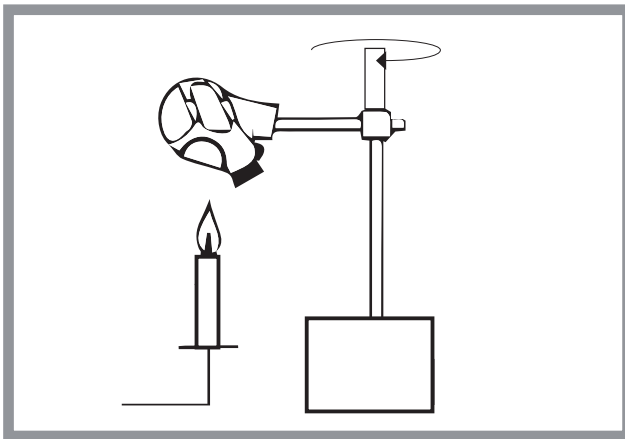
**CLASS ONE** Full Face Masks for light duty use

**CLASS TWO** Full Face Masks for general use

**CLASS THREE** Full Face Masks for special use

Note: There are 3 classes of full face masks, each class gives the same level of respiratory protection but has differences based on its application.

### These are some of the main tests conducted as part of the standard



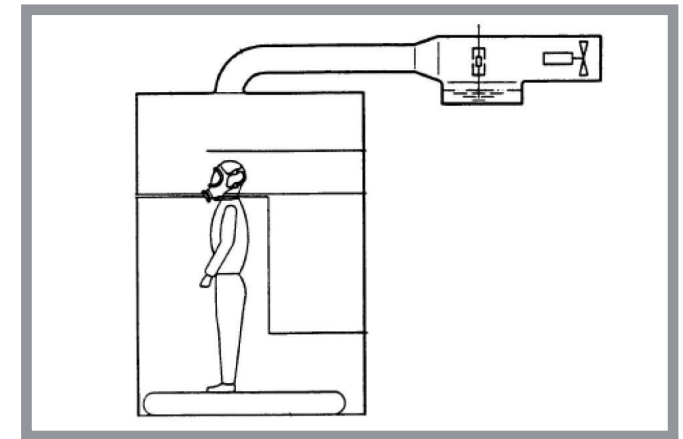
#### FLAMMABILITY TEST

A dummy head wearing a Full Face (FF) Mask is exposed to a flame. In order to pass the test the FF Mask shall not burn for more than 5 seconds after the flame is removed. This test is necessary for all 3 classes of FF Masks. Note: Class 3 masks are subjected to a more difficult flammability testing procedure.



#### HEAD HARNESS STRENGTH

When the mask is in position, each strap on the harness should withstand a pull of 100N (CLASS 1), or 150N (CLASSES-2&3) applied for 10 seconds in the direction of the pull. The test is deemed successful if there is no permanent linear deformation of the straps i.e. the length of the straps upon completion of the test should not be greater than 5% compared to their pre test measurement. For example 10cm vs. 10.5cm.



#### INWARD LEAKAGE

This test is carried out in a test chamber comprising a panel of 10 people and using a test agent of Sodium Chloride while people perform practical exercises that simulate real working conditions. The inward leakage test stipulates that the % of Sodium Chloride shall not exceed an average value of 0.05% of the inhaled air inside the mask.



## WHAT IS IEC 61482-2?

THIS STANDARD INVESTIGATES THE FABRIC AND GARMENTS ABILITY TO PROTECT AGAINST THE THERMAL EFFECTS OF AN ELECTRIC ARC. THIS CAN BE DONE VIA TWO TEST METHODS: 1. IEC 61482-1-1 (OPEN ARC TEST METHOD) AND 2. IEC 61482-1-2 (BOX TEST METHOD)



### IEC 61482-1-1 (OPEN ARC TEST METHOD)

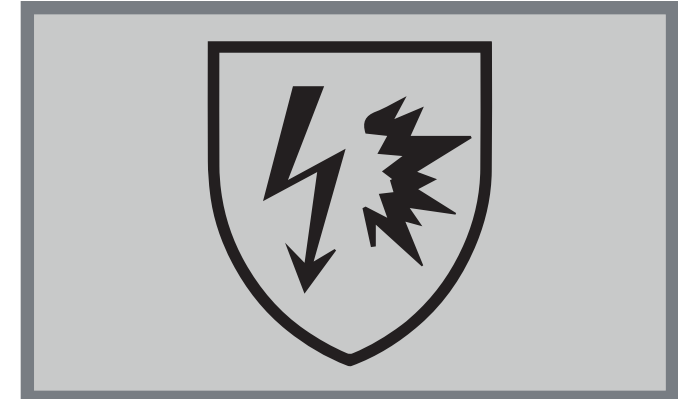
This test method aims to establish an ELIM (Incident Energy Limit) and an ATPV rating of a fabric and/or garment. These values, expressed as  $\text{cal}/\text{cm}^2$ , are the highest incident thermal energy to which the garment can be exposed without the wearer getting a second degree burn or the formation of holes in the fabric. The higher the cal rating of the garment or fabric, then the greater the protection for the wearer.



### IEC 61482-1-2 (BOX TEST METHOD)

This test method aims to establish an APC1 or an APC2 rating of a fabric and/or garment (APC=Arc Protection Class). Test conditions for APC1 & APC2 try to simulate typical exposure conditions for a short circuit current of 4kA and 7kA respectively.

A single layer garment in most cases will pass APC1. For APC2, a thicker fabric or multi layer system is required.



### WHAT IS AN ARC FLASH:

An electric arc is an intense flash of electricity which can result in numerous injuries.

Garments can be layered to achieve a better Cal rating. For example a thermal layer may achieve an Ebt of  $4.3 \text{ Cal}/\text{cm}^2$ , and an outer coverall may achieve an ATPV of  $13.6 \text{ Cal}/\text{cm}^2$ . However the combination ATPV/Ebt ratings will be greater than the sum of the two single layers, as the air gap between the two layers affords the wearer additional protection.

## WHAT IS EN ISO 20347?

THIS INTERNATIONAL STANDARD SPECIFIES BASIC AND ADDITIONAL (OPTIONAL) REQUIREMENTS FOR OCCUPATIONAL FOOTWEAR THAT IS NOT EXPOSED TO ANY MECHANICAL RISKS (IMPACT OR COMPRESSION).

### CLASSIFICATION I:

FOOTWEAR MADE FROM LEATHER AND OTHER MATERIALS EXCLUDING ALL-RUBBER OR ALL POLYMERIC FOOTWEAR

- 0B** Pass the min basic requirements for occupational footwear.
- 01** Basic requirements plus oil resistant sole, closed and energy absorbing seat region and antistatic.
- 02** As O1 plus water penetration and absorption.
- 03** As O2 plus cleated sole.

### CLASSIFICATION II:

(ALL-RUBBER OR ALL-POLYMERIC TYPES)

- 0B** Pass the min basic requirements for occupational footwear..
- 04** Basic requirements plus oil resistant sole, energy absorbing seat region, antistatic and a closed seat region.
- 05** As O4 plus penetration resistance and cleated sole.



**Occupational footwear** are safety shoes but do not feature steel toecaps. This type of footwear is designed to provide comfort, durability and slip resistance for workers in environments where the potential hazard of foot injury is considered adequately low.



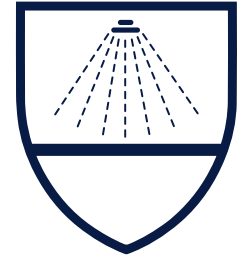
**Occupational footwear** is an ideal solution for workers who do not encounter hazards of impact or compression but may encounter hazards such as slips and muscle fatigue. These include offices, service sectors, showrooms and restaurants.

**PORTWEST HAS 6 FOOTWEAR STYLES; FD90, FW19, FW20, FW40, FW58 & FW90 THAT COMPLY WITH EN ISO 20347: 2012**

## WHAT IS EN 14605?

### PROTECTIVE CLOTHING AGAINST LIQUID CHEMICALS

THIS STANDARD SPECIFIES PERFORMANCE REQUIREMENTS FOR CLOTHING WITH LIQUID-TIGHT (TYPE 3) OR SPRAY-TIGHT (TYPE 4) CONNECTIONS, INCLUDING ITEMS PROVIDING PROTECTION TO PARTS OF THE BODY ONLY. (TYPES PB [3] AND PB [4])

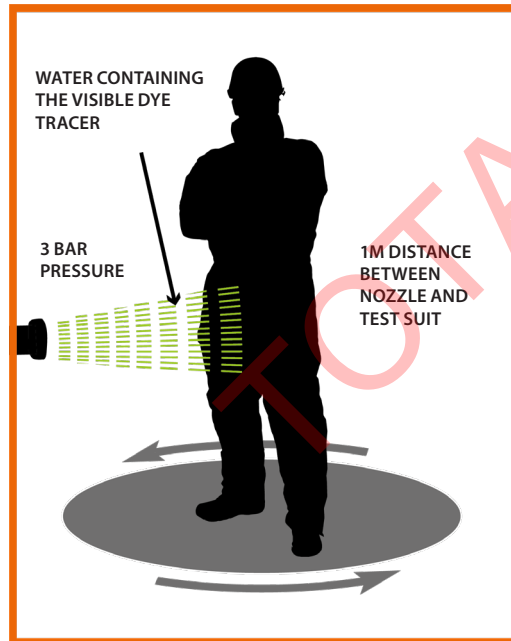


**Pass or Fail Criteria for EN 14605** - If any penetration is greater than 3 times the total calibration stain area. The above test's are repeated on 3 suits and all 3 must pass.



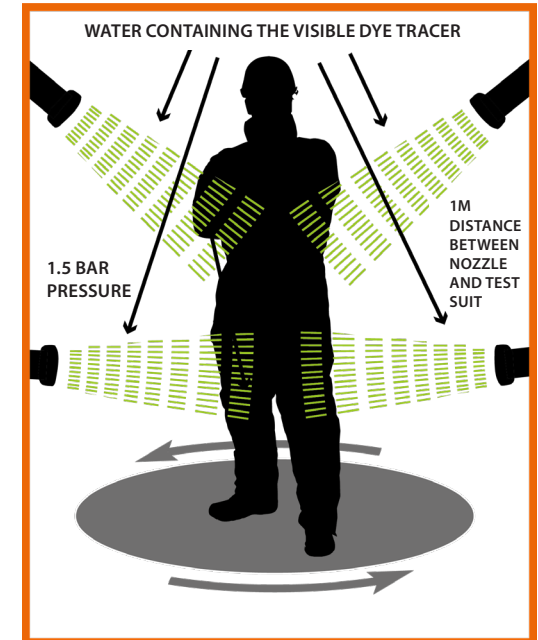
#### Liquid Tight Suits. (Type 3)

Suits which protect against strong jets of liquid chemicals. This test involves exposing a whole suit on a rotating platform to a series of short jets of a water based liquid containing a fluorescent or visible dye tracer, aimed at various critical parts of the suit.



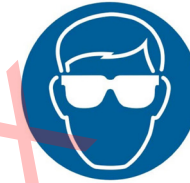
#### Spray Tight Suits. (Type 4)

Suits which protect against saturation of liquid chemicals. This test involves exposing a whole suit on a rotating platform to an intense spray of a water based liquids, containing fluorescent or visible dye tracer, aimed at various critical parts of the suit.





## WHAT IS EN 175?



### THIS IS THE EUROPEAN STANDARD FOR PPE FOR EYE AND FACE PROTECTION DURING WELDING AND ALLIED PROCESSES

THIS STANDARD SPECIFIES PROTECTION INCLUDING ERGONOMIC ASPECTS AGAINST RISKS OR HAZARDS OF RADIATIVE, FLAMMABLE, MECHANICAL OR AN ELECTRICAL NATURE. WELDING PPE INCLUDE SPECTACLES, GOGGLES AND FACE SHIELDS (MANUAL FACE SHIELDS AND HEAD-GEAR FACE SHIELDS).

#### THE EN 175 STANDARD INCLUDES:

##### 1. Principles of design:

The standard defines the minimum size of the visual field to allow the user to work safely but also to have a good field of vision during welding activities. Field of vision size is different for spectacles, goggles and face shields.

It also defines the characteristics of the materials used for this PPE, which must be opaque in all internal parts, to avoid reflecting light during welding processes.

##### 2. Impact resistance which can be:

- Low energy Impact 45 meter/ second: corresponding to marking "F" on the PPE including welding spectacles and goggles.
- Medium energy impact 120 meter/ second: corresponding to marking "B" on the PPE including goggles and face shields.

##### 3. Protection against Molten Metal splashes and hot solids projections:

This is an optional test for welding goggles and face shields (but not on spectacles) - when a PPE item passes this optional test it is marked with a corresponding marking "9".



PW65



PW60

PORTWEST HAVE 2 STYLES PW65 & PW60 COMPLY TO EN 175



## WHAT IS EN 374?

**EN (ISO) 374 PROTECTIVE GLOVES AGAINST DANGEROUS CHEMICALS AND MICRO-ORGANISMS - CONSISTS OF THE FOLLOWING:**

### EN ISO 374-1:2016

Terminology and performance requirements for chemical risks. Sets out the requirements of the standard. List of challenge chemicals increased from 12 to 18. Gloves no longer have to be tested to EN388 to be classed as chemical. Updated markings.

### EN 374-2:2014

Determination of resistance to penetration. 2 tests Air and Water leak test to check for holes.

### EN 374-4:2013

Determination of resistance to degradation by chemicals. Measures a change to the material from before to after the test.

### EN ISO 374-5:2016

Terminology and performance requirements for micro-organisms risks. Now includes an additional level for protection against Viruses.

### EN 16523-1:2015

Determination of material resistance to permeation by chemicals. Permeation by liquid chemical under conditions of continuous contact. Updated from EN374-3. Now includes additional cuff testing for gloves over 400mm in length.



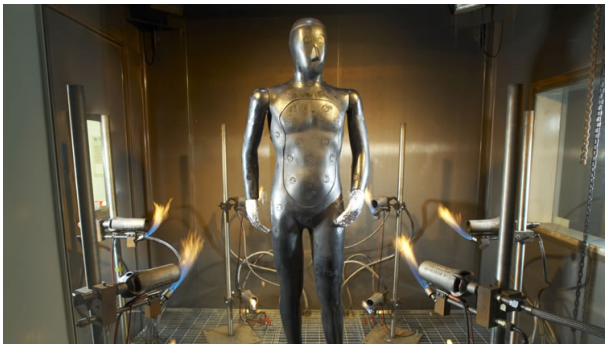
**PORTWEST HAVE 16 STYLES CERTIFIED TO EN 374:**

**AP60, AP91, A827, A835, A845, AP90, A881, A882, A810, A801, A802, A803, A812, A813, A814, A820**

## WHAT IS ISO 13506?

### ISO 13506 IS PART OF THE HEAT AND FLAME STANDARD EN ISO 11612

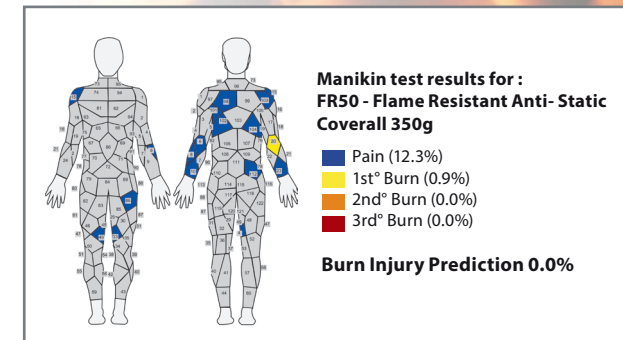
THIS OPTIONAL TEST EVALUATES HOW GARMENTS WILL PERFORM DURING A FLASH FIRE SITUATION. THE TEST GIVES A VERY ACCURATE REPRESENTATION OF THE LEVEL OF BURN INJURY SUSTAINED BY THE WEARER SHOULD THEY BECOME ENGULFED IN FLAMES. A LIFE SIZE, HEAT SENSING MANIKIN IS USED TO PRODUCE A BODY MAP WHICH USES COLOUR CODING TO INDICATE PREDICTED BODY BURN.



The manikin consists of over 100 temperature sensors positioned just beneath the surface on the body, arms, legs and head. The purpose of the sensors are to measure the variation in temperature on the manikin surface after exposure to flame.



In order to replicate a real life situation, the manikin is fitted with both undergarments and the garments to be tested. The manikin is then exposed to total flame engulfment for four seconds. Flames are provided by a system of propane burners surrounding the manikin.



Heat energy absorbed by the sensors is recorded, with data normally collected for up to 120 seconds after the burn. A report is then produced showing a "body map" indicating predicted body burn of either no burns, first, second or third degree burns and where they occurred.

**PORTWEST HAS 17 ITEMS (COVERALLS: FR50, FF50, FR60, FR28, FR21, FR22, AF22, AF53, AF73 & BIZ1) AND (ENSEMBLES: FR55/FR56, FR55/FR57, FR25/FR26, FR25/FR27, FR61/FR62, FR61/FR63 & BIZ2/BIZ30) TESTED TO ISO 13506**

## WHAT IS EN 1073-2?

### PROTECTIVE CLOTHING AGAINST RADIOACTIVE CONTAMINATION

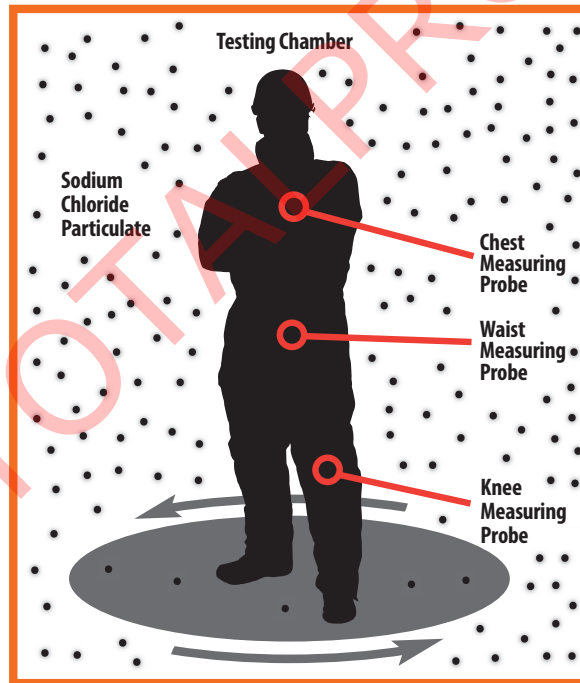
THIS STANDARD SPECIFIES THE REQUIREMENTS AND TEST METHODS FOR NON-VENTILATED PROTECTIVE CLOTHING AGAINST PARTICULATE RADIOACTIVE CONTAMINATION. THE STANDARD TESTS FOR INWARD LEAKAGE OF AEROSOLS & FINE PARTICLES AS TESTED IN EN ISO 13982-1.

#### PROCESS:

A person wearing the protective suit enters a "testing chamber". Beneath the protective suit, the person has three measuring probes attached (one on the chest, one at the waist and one at the knee). Sodium chloride particulates (average size of 0.6 microns) are distributed throughout the cabin, the wearer performs a series of three physical activities:

- » 3 minutes standing still
- » 3 minutes "on the spot" walking (5km/h)
- » 3 minutes squatting (at a rate of 5 squats per minute)

Sodium chloride particulates that penetrate the protective suit are counted by the probes beneath the suit. The results are used to determine both a performance classification and a "nominal protection factor".



#### Nominal Protection Factor & Performance Class for suit particle protection level:

Protection Level	Class	Nominal Protection Factor
Highest Protection	3	500
Medium Protection	2	50
Low Protection	1	5

A suit which offers the highest protection to the fine particulates will have low inward leakage, and thus a high nominal protection factor.



**PORTWEST HAVE 9 PRODUCTS TESTED TO EN 1073-2:  
ST30, ST35, ST36, ST80, ST50, ST60, ST40, ST41, ST70**



## WHAT IS EN 140?

THIS STANDARD SPECIFIES THE MINIMUM REQUIREMENTS FOR HALF MASKS AND QUARTER MASKS FOR USE AS PART OF RESPIRATORY PROTECTIVE DEVICES, EXCEPT ESCAPE APPARATUS AND DIVING APPARATUS

### DEFINITIONS:

**Half Mask** = A facepiece which covers the nose, mouth and chin

**Quarter Mask** = A facepiece which covers nose and mouth

### DESCRIPTION:

They are intended to provide adequate sealing on the face of the wearer against the ambient atmosphere. Air enters the facepiece and passes directly to the nose and mouth area of the facepiece through inhalation valve(s). When breathing the exhaled air flows to the ambient atmosphere via the exhalation valve(s) of the mask.

### KEY TESTS

#### 1. RESISTANCE TO TEMPERATURE

The masks are conditioned for 24h at 70°C and then for 24h at room temperature +30°C. If the facepiece and its components show no appreciable deformation the result is a pass.

#### 2. RESISTANCE TO FLAMMABILITY

The standard describes the procedure to test the masks by exposing them to a direct flame. Parts of the facepiece that might be exposed to flame during use shall either not burn or continue to burn for more than 5 seconds after the flame is removed. Resistance to temperature and flammability tests make sure the mask will maintain its performance in extreme conditions of use.

#### 3. BREATHING RESISTANCE

The breathing resistance of the facepiece when tested with a breathing machine shall not exceed

- » 2.0 millibar for inhalation
- » 3.0 millibar for exhalation

This test ensures breathing is comfortable when wearing the facepiece.

#### 4. INWARD LEAKAGE

When the facepiece is correctly fitted, the % of the ambient atmosphere outside the facepiece which is allowed to pass through the facepiece will not be greater than 2%. This test ensures the masks offers effective protection.

#### FILTERS

To protect from toxic agents, masks need to be used with filters, which are covered in EN 143 for particulate filters and EN 14387 for gas and combined filters (gas and particulate).



P410



P420



P430



## WHAT IS EN 381-5?

EN 381 IS THE EUROPEAN STANDARD FOR PROTECTIVE EQUIPMENT FOR USERS OF HAND HELD CHAINSAWS. THE STANDARD PROVIDES REQUIREMENTS FOR DIFFERENT TYPES OF PROTECTIVE CLOTHING AS FOLLOWS:

- EN 381- 5: Requirements for leg protectors
- EN 381- 7: Requirements for protective gloves
- EN 381- 9: Requirements for protective gaiters
- EN 381 -11: Requirements for upper body protectors

There are four levels of protection within EN 381. These correspond to the speed of the chainsaw in metres per second.

Class 0: 16 m/s  
Class 1: 20 m/s

Class 2: 24 m/s  
Class 3: 28 m/s

### EN 381- 5 SPECIFIES REQUIREMENTS FOR LEG PROTECTORS

Leg protectors use special fibres that clog the cutting mechanism of a chainsaw and stop the movement. There are three types of leg protection, type A, B, and C.

#### TYPE A AND B

Leg protectors provide protection at the front of the legs only and are intended for professional forestry workers.

#### Type C

Leg protectors have protective fibres around the circumference of the legs and are intended for non professional use.



CH11

CH12

PORTWEST HAVE TWO STYLES CERTIFIED TO EN 381 -5, CH11 AND CH12. BOTH ITEMS MEET EN 381 -5 1995: CLASS 1, TYPE A

## WHAT IS L.E.D & COB?

**L.E.D:** stands for "Light Emitting Diode", an L.E.D is a small piece of semi conducting material that contains various compounds. When electricity is passed through these semi conductive materials light is emitted in the form of photons. This process is call electro-luminescence.

**COB L.E.D:** COB is a new technology that has changed the face of bulbs for the future, using silicon/chip technology COB lights now use less battery power while providing far superior brightness that is unrivalled by any other lamps on the market.



### EFFICIENCY



### COB L.E.D.

Typical L.E.D light life span 20,000 (L.E.D) To 50,000 (COB L.E.D) Hours



### L.E.D

An L.E.D light can produce the same amount of lumens as an Incandescent while using only 25% of the power. Up to 90% of incandescent lights energy is heat created by electrical resistance filament (i.e they are more efficient as heaters than lights).



RoHS - Restriction Of Hazardous Substances'. The 'Restriction Of Hazardous Substances' directive is put in place to ensure all componenets of our electrical products will not endanger the user. All our lights are tested to this standard with compliance.



CE - This symbol indicates conformity of essential health and safety requirements as set out in European directives.



## WHAT IS BS 8599-1?

### WORKPLACE FIRST AID KITS

The standard specifies the correct contents for small, medium, large or travel-size kits and recommends how many kits are needed depending on the size of the organisation.

Compliance with this standard demonstrates that the kits are a better product and enable customers to meet their health and safety obligations under the Health and Safety Executive (HSE) guidelines.

BS 8599-1 is the standard that sets the minimum level that first aid kits should conform to:



#### First Aid Workplace Kit Contents

Content List	Small FA10	Medium FA11	Large FA12
Guidance leaflet	1	1	1
Contents List	1	1	1
Medium sterile dressing: 2m x 7.5cm, absorbent pad 12cm x 12cm	2	4	6
Large sterile dressing: 2m x 10cm, absorbent pad 18cm x 18cm	2	3	4
Triangular bandage: 90cm x 90cm x 127cm	2	3	4
Eye pad sterile dressing: looped bandage 1m x 5cm, oval pad 7.5cm x 5cm	2	3	4
Sterile Adhesive Dressings - Assorted	40	60	100
Alcohol free moist cleansing wipes: 11 x 7.5cm	20	30	40
Adhesive tape: 5m x 2.5cm	1	2	3
Nitrile disposable gloves: EN 455 size large (Pair)	6	9	12
Finger sterile dressing: 44 x 4cm, absorbent pad 4 x 4cm	2	3	4
Resuscitation face shield with valve*	1	1	2
Foil blanket: 140 x 210cm	1	2	3
Burn dressing: water-based gel soaked dressing 10 x 10cm**	1	2	2
Scissors	1	1	1
Conforming bandage: 4.5m x 7.5cm	1	2	2
Wall mountable bracket	1	1	1

**PORTWEST HAVE 3 STYLES THAT ARE BS 8599-1:2019 COMPLIANT: FA10, FA11, FA12 AND 3 STYLES THAT ARE BS 8599-2:2014 COMPLIANT: FA21, FA22 AND FA23**



## WHAT IS RIS-3279-TOM ISSUE 1?

THIS IS A RAILWAY GROUP STANDARD THAT SPECIFIES THE MINIMUM SPECIFICATION FOR HIGH-VISIBILITY WARNING CLOTHING IN THE UK RAIL INDUSTRY ENSURING WORKERS ARE CONSPICUOUS WHEN ON OR NEAR RAILWAY LINES



S590

### RIS-3279-TOM

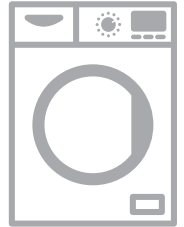
Is based on the European standard EN ISO 20471. It defines the minimum areas of high-visibility orange background materials to be used within a garment and the minimum level of photometric performance criteria for the reflective tape. The standard requires a reflective tape reading of  $\geq 330$  (cd/ lx.m<sup>2</sup>) however at Portwest we insist on a reading of  $\geq 400$  (cd/ lx.m<sup>2</sup>).

### RIS-3279-TOM

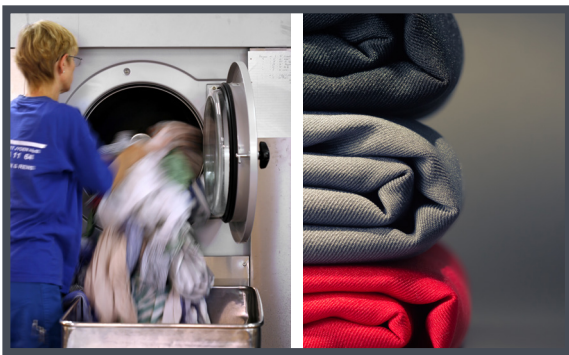
Imposes a higher concentration for high-visibility orange fabric for railway workers. This increases the conspicuous nature of the fabric and ensures the rail worker is more visible. A spectrophotometer is used to check the chromaticity (colour intensity) of the orange high-visibility fabric. Portwest check every roll of fabric to ensure the fabric meets the requirements of RIS-3279-TOM.



## LAUNDERING OF FR PRODUCTS



GARMENTS MUST BE LAUNDERED ACCORDING TO THE MANUFACTURERS INSTRUCTIONS, INCORRECT LAUNDERING OF FLAME RESISTANT GARMENTS CAN SERIOUSLY AFFECT THEIR PERFORMANCE AND FIT



### Pretreatment:

- If dirty stains are difficult to remove, they can be treated before washing with a liquid detergent applied directly to stains and lightly rubbed.
- Never use chlorine bleach or washing detergents containing bleach as these will reduce the flame resistance properties of the fabric.
- Fabric softeners, starches and other laundry additives are not recommended as they can mask the flame resistance performance and may also act as a fuel in case of combustion.

### Washing:

- Always wash contaminated workwear separately
- Always follow the washing temperature on the garment label.
- Always wash and dry garments inside out to minimize surface abrasion and help maintain the surface appearance of the fabric.
- Zips and Velcro fastenings should be closed during washing.
- To ensure a cleaner wash, avoid overloading the machine so the garments can move freely through the wash and rinse cycles.

### Drying:

- Tumble drying is not usually recommended as the temperature used is often too high and can cause garment shrinkage
- It is vital that cotton or cotton mix garments are not over dried as over drying has been determined to be the main cause of excessive garment shrinkage.
- Do not hang in direct sunlight as this can cause fading