

Performance Standards

Hand and Arm Protection

Standard Pictogram Description Rating EN388

Mechanical

Hazards

- a) Resistance to abrasion
- b) Blade cut resistance
- c) Tear resistance
- d) Puncture resistance 0-4

0-5

0-4

0-4

x = test N/A

EN407

Thermal

Hazards

- a) Burning behaviour
- b) Contact heat
- c) Convective heat
- d) Radiant heat
- e) Small splashes of molten metal
- f) Large splashes of molten metal 0-4

0-4

0-4

0-4

0-4

0-4

x = test N/A

ANSI - ISEA 105: 2005 Cut Resistance (CPPT) >250gms

>500gms

>1000gms

>1500gms

>3500gms Level 1

Level 2

Level 3

Level 4

Level 5

Workwear

Material solutions are available to provide compliance in each of the following categories:

Protection Against Heat and Flame – BS EN 531:1995

EN 531 applies to all workers who may be exposed to heat, flame or hot materials.

The standard covers:

- Flame Spread (Code Letter A): In meeting the requirements of Code Letter A, compliance with Index 3 of EN 533:1997 is also achieved.

- Convective Heat (Code Letter B): When tested in accordance with EN 367, a heat transfer index (HTI) is derived (Code Letter B, Levels B1 to B5). The HTI specifies the time, in seconds, for the fabric assembly to experience a 24°C temperature rise and is denoted in 5 categories:

- Radiant Heat (Code Letter C): (Code Letter C, Levels C1 to C4) : When tested in accordance with EN 366 Method B, this standard measures the time taken, in seconds (t₂), for a temperature rise through the fabric to cause the onset of second degree burns and is denoted in 4 categories:

Performance Levels

HTI (EN367 Method B) Min.Max. B1

3

6

B2

7

12

B3

13

20
B4
21
30
B5
31

Performance Levels

t2
(EN366 Method B)Min.Max.C1
8
30
C2
31
90
C3
91
150
C4

151

All Rhino workwear materials meet or exceed A, B1 and C1 performance levels.

Protection Against Wet Weather – BS EN 343:2003

This standard prescribes three classes of water resistance and vapour permeability for materials used in wet environments. Tilsatec ‘Marlin’ is an engineered fabric composite designed to be water repellent and highly impermeable to water penetration, whilst still retaining water vapour permeability, providing comfort and breathability. In addition, personal protection is enhanced by the inclusion of permanent flame and electric arc resistance. All fabrics within the Marlin range achieve the highest levels of compliance within the standard:

Class 3: water impermeability (>13 kPa)

Class 3: water vapour permeability (<20 m_ Pa/W)

Protection Against Electrostatic Discharge – BS EN 1149:1996

This standard is designed to eliminate the build up and discharge of electrostatic energy which may cause a significant hazard in work environments where explosive or flammable gases or particles are present. BS EN 1149-1 denotes surface resistivity test methods and performance requirements, whilst EN 1149-3 denotes a ‘charge decay’ test method with performance levels specified in BS EN 1149-5. Most woven materials within the Rhino workwear range comply with both EN 1149-1 and 3, whilst knitted materials comply with EN1149-3 only.

Protection Against Welding - BS EN 470-1:1995

This standard encompasses the key requirements of BS EN 531 as well as providing protection against small metal droplets. To comply with this standard, materials must resist 15 drops of molten metal on the same small area without causing a significant temperature rise on the underside of the fabric.

Protection Against Molten Metal - BS EN 531:1995

Whilst EN 470-1 describes protection against small metal droplets, code letters ‘D’ and ‘E’ of EN 531 are designed to protect against larger molten metal splashes which may be experienced in foundry operations. Assessment of performance is determined after the test by measuring the damage to a layer of ‘synthetic’

skin placed beneath the fabric. Code Letter D – To comply with this part of EN 531 materials must reach a minimum standard of D1 with molten aluminium poured at a 60° angle. It is assumed that materials reaching this standard will also be suitable for use with aluminium-bronze, all types of slag and aluminium bath. Options are available in Rhino workwear for D2 and D3 protection levels. Performance Levels (BS EN373 Method) Splash Index

(g) Aluminium Min. Max. D1100

200

D2

201

350

D3

351

Code Letter E – To comply with this part of EN 531 materials must reach a minimum standard of E1 with molten iron poured at an angle of 75°. It is assumed that materials reaching this standard will also be suitable for use with steel, copper, phosphor-bronze and brass. Options are available in Rhino workwear for E2 and E3 protection levels. Performance Levels (BS EN373 Method) Splash Index (g) Iron Min. Max. E1

60

120

E2

121

200

E3

201

Whilst currently not included within EN 531, protection against splashes of cryolite (Sodium Aluminium Fluoride) is covered by the IPAI Test Method Procedure B (1998). This method determines the mass of cryolite for which protection is provided and also calculates an ‘Index’ derived from the fabric weight tested and a maximum mass of cryolite for which protection is given. A specially developed 380gm/m² fabric is available within the Rhino workwear range to provide an exceptional 85 gms of cryolite resistance with a resultant protection ‘Index’ of 0.21.

Protection Against Arc Flash Exposure

Arc flash is an extremely hazardous incident associated with the release of energy caused by an electric arc. It occurs when electrical insulation or isolation between conductors is broken or can no longer withstand the applied voltage. Arc Flash can occur if an employee is working on or near energized conductors or circuits and can be caused by a number of conditions, such as inserting a tool in the wrong place or dropping a tool into a circuit breaker or service area. The thermal temperature of an arc flash explosion can reach more than 2500°C and carries significant threat of serious burn injury.

Two international standards exist to quantify the level of arc protection offered:

NFPA 70E – ‘Standard for Electrical Safety in the Workplace’ : Using the ASTM F1959-05 test method, NFPA 70E requires the calculation and creation of a ‘flash protection boundary’. This imaginary boundary, which surrounds the potential arc point, specifies the level of personal protective clothing and equipment which must be used by qualified workers who enter within that boundary. NFPA 70E defines an Arc Thermal Protection Value (ATPV) of 8 calories/cm² which materials must meet to prevent the onset of second degree burns. A lightweight Rhino fabric (TTP033, 300gm/m²) has been certified to provide an ATPV of 11.9 cal./cm² with a heat attenuation factor (heat blocking) of 83%. The waterproof and breathable Tilsatec Marlin fabric (360gm/m²) has also been certified under this standard to 20.0 cal./cm².

EN50354 : 2004 – Protection Against Electric Arc Hazards : This standard provides Pass/Fail criteria for fabric assemblies at 4kA (Level 1) or 7kA (Level 2).

A number of Rhino fabric options exist to achieve Level 1 protection, whilst Level 2 protection is achieved with a single layer of the Tilsatec Marlin fabric. Few materials exist at weights of less than 450gm/m² which can achieve Level 2 protection in a single layer.