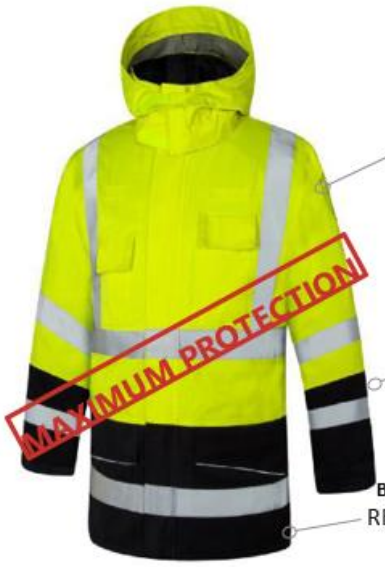
STANDARDS EXPLAINED



FUTURE GARMENTS STYLE CODE	ARC FR RESULTS
AC231-000-024	Ebt_{50} 5.9 Cal/cm^2
BS108-000-034/211/209/293	ATPV 10.8 Cal/cm^2
BS120-000-024	ATPV 10.8 Cal/cm^2
FJ534-000-024	ATPV 12.6 Cal/cm^2
HT041-000-005	Ebt_{50} 5.9 Cal/cm^2
JK938-000-255	ATPV 10.8 Cal/cm^2
PS137-000-005/024/029	ATPV 9.1 Cal/cm^2
PS151-000-211	ATPV 6.8 Cal/cm^2
PS153-000-024	Ebt_{50} 5.0 Cal/cm^2
SS015-000-005/024/029	ATPV 12.6 Cal/cm^2
SS052-000-034	ATPV 12.6 Cal/cm^2
TR040-000-034	ATPV 10.8 Cal/cm^2
TR181-000-024/005	ATPV 10.8 Cal/cm^2
TR380-000-024	Ebt_{50} 5.9 Cal/cm^2
TS001-000-024	Ebt_{50} 5.0 Cal/cm^2

IEC 61482

An explosive release of energy caused by an electrical arc. An Arc Flash results from either a phase to ground or a phase to phase fault caused by such occurrences as accidental contact with electrical systems, build up of conductive dust, corrosion, dropped tools, and improper work procedures. During an Arc Flash, the temperature can reach 35,000° Fahrenheit, and exposure to an Arc Flash can result in serious burn injury and death. Every year, more than 2,000 people are admitted to burn centres with severe Arc Flash burns!! Awareness of the dangers of Arc Flash incidents and the need to protect your team with specialist Arc Flash protection is more important today than it has ever been. A focus on Arc Flash protection will only increase as you become more aware of the dangers an Arc Flash incident can pose. Mitigating risk with safe working practices and by providing appropriate garments that offer superior Arc Flash protection saves lives every day.

BS EN 61482-1-2 - Protective clothing against the hazards of an electric arc The standard defines two testing conditions, namely Class 1 and Class2:

Class 1 test at an Arc current of 4 kA and Arc duration of 500ms.

IEC 61482 - 1 “Open Arc Test Method”

The arc rating is most commonly quantified by the Arc Thermal Performance Value (ATPV) determined by the open arc test method IEC 61482-1. The ATPV represents the maximum incident thermal energy in units of energy per surface area (e.g. kJ/m2 or cal/cm2) that a fabric can support before the wearer will suffer 2nd degree burns. The break-open threshold energy (or EBT) is another fabric characteristic. It represents the highest incident energy exposure value on a fabric where the garments do not exhibit break-open. The formation of holes in the fabric caused by break-open would allow heat or flames to pass through. Workers are assumed safe if the arc rating of their clothing (or ATPV value) exceeds the electric arc incident energy as calculated in the worst case scenario of a risk assessment. Materials or assemblies are given an ATPV value, expressed in kilojoules per square metre (kJ/m2), which can be converted into the familiar cal/cm2.

Class 2 tests at an Arc current of 7 kA and an Arc duration of 500ms.

IEC 61482-1-2 “Box Test”

The box test is another way to measure the protective performance of clothing against the thermal effects of an electric arc, and is defined in the IEC 61482-1-2 test method. In this test, the fabric is exposed to an electric arc confined in a specific box with a specific electrode arrangement.

A fabric passes the test:

- If the heat transferred behind the fabric does not cause second degree burn
- If the after flame time is below 5 seconds
- If there is no melting to the inner side of the fabric
- If a hole caused by the arc is not larger than 5 mm in every direction (in the inner most layer) The box test standard defines two testing conditions, known as Class 1 and Class 2. Test conditions for Class 1 try to simulate typical exposure conditions for a short circuit current of 4 kA protected by devices limiting the duration of the arc to 0.5 seconds in confined space, and of 7 kA respectively for Class 2.

BS EN ISO 11612:2008* – Protective Clothing to Protect against Heat and Flame

This standard specifies performance requirements for garments made from flexible materials, which are designed to protect the wearer’s body (except the hands) from heat and/or flame. The performance requirements set out in BS EN ISO 11612:2008 are applicable to garments which could be worn for a wide range of end uses, where there is a need for clothing with limited flame spread properties and where the user can be exposed to radiant or convective or contact heat or to molten metal splashes.

The following parameters are used:

Code A1 – Limited flame spread to outer surface
Code A2 – Limited flame spread to edge
Code B – Convective heat
Code C – Radiant heat
Code D – Molten aluminium splash
Code E – Molten iron splash
Code F – Contact heat

BS EN ISO 14116:2008* – Protective Clothing to Protect against Heat and Flame – Limited Flame Spread

This standard specifies the performance requirements for the limited flame spread properties of materials and protective clothing in order to reduce the possibility of the clothing burning and itself constituting a hazard. Protective clothing complying with BS EN ISO 14116:2008 is intended to protect workers against occasional and brief contact with small igniting flames, in circumstances where there is no significant heat hazard and without presence of another type of heat. When protection against heat hazards is necessary in addition to protection against limited spread flammability, then standards, such as BS EN ISO 11612, are more appropriate.

BS EN ISO 11611:2008* - Protective Clothing for use in Welding and Allied Processes

Clothing is intended to protect the wearer against spatter (small splashes of molten metal), short contact time with flame, radiant heat from the arc, and minimise the possibility of electrical shock by short-term, accidental contact with live electrical conductors at voltages up to approximately 100v in normal conditions of welding.

BS EN 1149-5:2008 - Protective Clothing -Electrostatic Properties - Part 5: Material Performance and Design Requirements

This European Standard specifies material and design requirements for electrostatic dissipative protective clothing, used as part of a total earthed system, to avoid incendiary discharges. The standard specifies three areas 1) Performance requirements of materials

2) Design requirements

3) Marking and guidance

BS EN 13034:2005 - Protective Clothing against Liquid Chemicals

This standard specifies the minimum requirements for limited use and re-useable limited performance chemical protective clothing. 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 the molecular level) is not required. 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.

*These standards are now updated to 2015 and all Future Garments products will meet the requirements of the 2015 Standards.