

Brief information about standards and markings for clothing that appear in our catalogue



EN ISO 11612 - CLOTHING TO PROTECT AGAINST HEAT AND FLAME

Clothing approved under the EN ISO 11612 standard provides protection while working in hot environments where there is a risk of sudden contact with a small flame. The clothing also provides various degrees of protection against heat convection and radiant heat for a limited time and intensity. The standard does not apply for welding operations or equipment for fire-fighters.

Coding

A, Limited flame spread.

Classes:

A1 and A2. No edge ignition, no burn holes, no molten debris and no flaming. After glow time shall be less than 2 seconds.

Tests are conducted by applying the flame from the edge of the fabric and from above. A1 is surface ignition and A2 is edge ignition.

B, Convective heat:

B1, B2 and B3. The HTI (Heat Transfer Index) indicates how many seconds it takes to attain a temperature rise of 24°C. Highest class B3.

C, Radiant heat:

C1, C2, C3 and C4. The number of seconds it takes for radiant heat to cause the temperature to rise by 24°C. Highest class C4

D, Molten aluminium splash:

D1, D2 and D3. A PVC membrane is attached to the reverse of the fabric sample and the minimum amounts of molten aluminium for each class are then splashed on the sample. The PVC membrane must be undamaged after the test has been carried out. The highest class is D3.

D, Molten iron splash:

E1, E2 and E3. A PVC membrane is attached to the reverse of the fabric sample and the minimum amounts of molten iron for each class are then splashed on the sample. The PVC membrane must be undamaged after the test has been carried out. The highest class is E3.

F, Contact heat.

F1, F2 and F3. Indicates the resistance of the fabric in seconds. The fabric shall not ignite or shrink due to temperatures of up to 250°C. (This code was not included in EN 531)

Some design requirements: - The garment must cover the whole upper body, neck, arms and legs. Jackets/tops must overlap with trousers/bottoms when the body is moving, e.g. when stretching or kneeling.

The following also apply for codes D and E: - trouser legs and sleeves must not be turned up.

- all pockets must have flaps that are at least 20 mm wider than the actual pocket opening. This rule does not apply to side pockets on trousers with openings placed at an angle of less than 10° to the side seam.

Other details: - Codes A, B and C are mandatory, while codes D, E and F are optional requirements.

- Specific tests are conducted to ensure that fabrics and seams meet the requirements for strength and dimensional stability to washing.

- CARE INSTRUCTIONS: Follow the washing instructions on the label in your garment. Close zips and buttons before washing the garment. Only use a synthetic detergent. Check the garment after washing and drying before use.



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

(Protective clothing for use in welding and allied processes)

Clothing approved under the EN ISO 11611 standard provides protection for those carrying out welding operations. There are two classes - Class 1 and Class 2. (See the comparison below)

Coding

Molten metal:

Class 1: 15 drops may cause a temperature rise of 40° on the fabric's reverse side without ignition

Class 2: 25 drops may cause a temperature rise of 40° on the fabric's reverse side without ignition

Heat transmission: Class 1: At least 7 sec, 20 kW/m² heat flow

Class 2: At least 16 sec, 20 kW/m² heat flow

Some design requirements:

- The garment must cover the whole upper body, neck, arms and legs. Jackets/tops must overlap with trousers/bottoms when the body is moving, e.g. when stretching or kneeling.

- all pockets must have flaps that are at least 20 mm wider than the actual pocket opening. This rule does not apply to side pockets on trousers with openings placed at an angle of less than 10° to the side seam. A ruler pocket with an opening of 75 mm or less may be placed behind the side seam.

- trouser legs and sleeves must not be turned up.

Other:

- Specific test methods are used to ensure that fabrics and seams meet the requirements for wear, tear and washing.



EN 1149-5 - PROTECTIVE CLOTHING - ELECTROSTATIC PROPERTIES - Part 5: Material performance and design requirements (Protective clothing - Electrostatic properties - Part 5: Material performance and design requirements)

Clothing approved under the EN 1149-5 standard provides protection against the danger caused by static electricity.

Some design requirements:

- Buttons, zips and other fastenings must be covered with the anti-static fabric.

Other:

- When the EN-1149-1 standard or the EN 1149-3 standard is mentioned, this is the designation of fabrics that meet the standard's requirements for electrostatic properties.

- The use of protective footwear marked with ESD is recommended.



EN 61482-1-2/IEC 61482-2 - LIVE WORKING – PROTECTIVE CLOTHING AGAINST THE THERMAL HAZARDS OF AN ELECTRIC ARC (Live working - Protective clothing against the thermal hazards of an electric arc. Part 2: Requirements.

EN 61482-1-2/IEC 61482-2 is the first European standard covering protective clothing against electric arcs
There are two classes (see the comparison below).

Coding

Class 1: Equivalent to 4 kA, 400 volt for 500 ms. The material or garment must not burn for more than 5 seconds, melt through or form holes larger than 5 mm.

Class 2: Equivalent to 7 kA, 400 volt for 500 ms. The material or garment must not burn for more than 5 seconds, melt through or form holes larger than 5 mm.

Some design requirements:

- Buttons, zips and other fastenings must be covered by the electric arc resistant fabric.

Other:

- IEC61482-2 requires garments to be sewn with flame resistant threads. This is not a requirement for garments complying with the EN 61482-1-2 standard.

ATPV
XX.X
Cal/cm²

ATPV (Arc Thermal Protective Value)

ATPV indicates that the garment/fabric has been arc flash tested according to the EN 61482-1-1/ASTM F1959 standard and provides protection against incident energy, the value of which is given in units of calories per square centimetre. The ATPV shows the lowest rating at which the energy of the electric arc causes the fabric to break open. At this value, there is a 50% probability that sufficient heat will transfer through the garment/fabric to cause a second-degree burn injury based on the Stoll Curve. The higher the value, the better the protection provided by the garment/fabric. When working in an environment where there is the possibility of being exposed to an arc flash, it is important to wear several layers of clothing, e.g. with a flame-resistant base layer, to provide strong protection.



EN 13034 Type PB [6] 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)

The garment should be used together with chemical resistant gloves, boots and other garments that offer protection according to the EN 13034 standard. The protective clothing can be used where there is a risk of minor exposure to chemical splashing/splattering, where a full chemical barrier is not required. Specialist industrial laundering is required for reapplication of the garment; reapplication should be performed after 5 washes to maintain protection. Type PB[6] garments provide partial body protection and have not been subjected to a whole-suit test (5.2). The material has been tested against the following chemicals in accordance with the EN 13034 standard: Sulphuric acid, H2SO4 30%, Sodium Hydroxide, NaOH 10%, O-Xylene, Butan-1-ol. For information and results for repellency and penetration of liquid chemicals (index 1-3, highest level 3) for each garment, please see the information inside the garment.

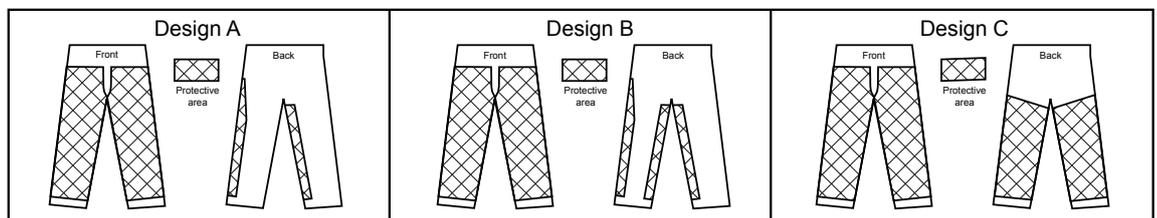
Test	Method	According to the required standard EN 13034:2005
The following fabric properties have been tested (levels 1-6, with 6 being the highest level):		
Abrasion resistance	EN 530-2	Level 1 > 10 cycles
Tearing strength (Trapezoid procedure)	ISO 9073-4	Level 1 > 5N
Breaking strength	EN ISO 13934-1	Level 1 > 30N
Puncture resistance	EN 863	Level 1 > 5N
Seam strength	EN ISO 13935-2	Class 1 > 30N



EN 381-5 - CHAIN SAW PROTECTION, REQUIREMENTS FOR LEG PROTECTORS

Garments approved under the EN 381-5 standard are intended for use during logging/chainsaw operations. There are three classes where the classification describes how the trouser protection withstands the speed of the chainsaw. Choice of design: Designs A and B both cover the front of the legs and are intended for use in normal logging work by professional foresters who are highly-trained and knowledgeable in the field. However, designs A and B differ with respect to the protection on the inside of the leg. See the diagram. Design C covers the whole leg and is intended for use by persons who do not normally work with chainsaws or extraordinary situations, e.g. work in trees. Make sure that the chainsaw protection in the trousers overlaps the chainsaw protection in the footwear.

Klass 1: 20 m/s
Klass 2: 24 m/s
Klass 3: 28 m/s





EN ISO 20471/EN 471 - HIGH VISIBILITY PROTECTIVE CLOTHING FOR PROFESSIONAL USE - Test methods and requirements. Certified high-visibility garments conform to the requirements of the EN 471 and EN ISO 20471 standards. These stipulate the surface area for reflective and fluorescent materials, and the luminance and colourfastness of the fabrics. There are also strict design requirements regulating the placing of reflectors, fluorescent material, etc. The safety classification (1-3) for area and reflective material is stated next to the symbol inside the garment, with 3 being the highest class.

Minimum area requirements for approval under EN 471/EN ISO 20471	CLASS 1	CLASS 2	CLASS 3
High-visibility fabric/fluorescent area	0.14 m ²	0.50 m ²	0.80 m ²
Reflective	0.10 m ²	0.13 m ²	0.20 m ²
Combined background/reflective	0.20 m ²	-	-

Some design requirements:

- The areas shown in the chart above are calculated for the smallest size of each model.
- The fluorescent material must go all the way round the body, arms and legs.
- The lower reflective strip must be at least 5 cm from the bottom of the garment. There must be at least 5 cm between the reflective strips.
- If a fabric in a contrasting colour is used, there must be about the same amount of this fabric on the front and back of the garment.

Other:

- A combination of, for example, trousers in Class 2 with a jacket in Class 1 does not automatically give Class 3.
- There are certain differences in design requirements between EN 471 and EN ISO 20471. The EN ISO 20471 standard also requires the fabric to pass the luminance tests after being washed at least five times.



EN 343 - PROTECTIVE CLOTHING - PROTECTION AGAINST BAD WEATHER

This standard specifies the requirements for clothing designed to give protection against bad weather. The standard requires tests to be conducted on fabrics and seams. The values next to the umbrella symbol indicate the waterproofing (class 1-3) and the water vapour permeability (class 1-3) of the garment. Class 3 indicates the best performance.



EN 342 - PROTECTIVE CLOTHING - PROTECTION AGAINST COLD

Clothing approved under the EN 342 standard provides protection against cold. The definition of cold is, according to the standard, environments with temperatures below -5°C. Requirements relating to thermal insulation (indicated as mK/W, the higher the better), air permeability (class 1-3 where 3 is the best) and water (optional).

OEKO-TEX® STANDARD 100

Björnkärläders continues its environmental work by certifying its garments in line with the requirements of the Oeko-Tex standard. The Oeko-Tex® Standard 100 label ensures the human ecological quality of a product. Certified garments are manufactured from materials and components that have been inspected for chemical content in line with the Oeko-Tex testing system. To find out which garments are certified under the Oeko-Tex Standard, please visit our website: www.grolls.se

