

Protective clothing for use in welding and allied processes.

Reference Number: EN 11611

Status: European Standard

Scope: This International Standard specifies minimum basic safety requirements and test methods for protective clothing including hoods, aprons, sleeves and gaiters that are designed to protect the wearer's body including head (hoods) and feet (gaiters) and that are to be worn during welding and allied processes with comparable risks. For the protection of the wearer's head and feet, this International Standard is only applicable to hoods and gaiters.

CONTENT

Remarks:

This International Standard does not cover requirements for hand protection.

This type of protective 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 minimizes the possibility of electrical shock by short-term, accidental contact with live electrical conductors at voltages up to approximately 100 V d.c. in normal conditions of welding. Sweat, soiling or other contaminants can affect the level of protection provided against short-term accidental contact with live electric conductors at these voltages.

This International Standard specifies two classes with specific performance requirements (see Annex A), i.e. Class 1 being the lower level and Class 2 the higher level. -

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

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

Details are given in Table 1 and Annex B. For adequate overall protection against the risks to which welders are likely to be exposed, personal protective equipment (PPE) covered by other standards should additionally be worn to protect the head, face, hands and feet.

Scope:

Small splashes of molten metal
Short contact time with flame
Radiant heat from the arc
Ultra violet radiation

Class 1 Less hazardous welding techniques / situations
Class 2 More hazardous welding techniques / situations

The standard specifies 3 areas:

1. Performance requirements material
2. Design requirements
3. Marking & guidance

1) Performance requirements for woven fabrics (after pretreatment*)

| TEST | METHOD | REQUIREMENT |
|---|-----------------------|---|
| Physical requirements | | |
| Dimensional change due to cleaning | ISO 5077 | Max 3% |
| Tensile strength | ISO 13934-1 | 400N |
| Tear strength | ISO 13937-2 | 20 N |
| Innocuousness · pH value · Cr (VI) content Innocuousness is tested in new state material | ISO 3071 ISO 17075 | >3.5 - < 9.5 Less than detection limit |

| TEST | METHOD | REQUIREMENT |
|---|-----------|---|
| Heat and flame requirements | | |
| Limited flame spread (code A) <ul style="list-style-type: none"> A1: surface ignition A2: edge ignition | ISO 15025 | <ul style="list-style-type: none"> No flaming to the top or edge No hole formation No flaming or molten debris Mean after flame time max 2 s Mean afterglow time max 2 s |
| Impact of spatter | ISO 9150 | <ul style="list-style-type: none"> Class 1: minimum 15 drops before raising 40K behind the material Class 2 : minimum 25 drops before raising 40K behind the material |
| Radiant heat | ISO 6942 | Class1: HTI ₂₄ > 7seconds Class 2: HTI ₂₄ > 16 seconds |
| Electrical resistance | EN 1149-2 | < 10 ⁵ Ω |

* Pretreatment:

All tests, with the exception of innocuousness, in EN ISO 11611 are carried out after a cleaning pretreatment. The amount of cleaning cycles and cleaning method is set by the manufacturer based on standardized cleaning standards. The limited flame spread (letter code A) is also carried out after the maximum amount of cleaning cycles, set by the manufacturer based on standardized cleaning standards.

Cleaning methods:

ISO 6330 Domestic laundry
ISO 15797 Industrial laundry
ISO 3175-1 Dry cleaning

Informative ANNEX A - Guidance for selection of type welders' clothing

| Welders' Clothing Type | Selection criteria relating to the process: | Selection criteria relation to the environmental conditions |
|------------------------|--|---|
| Class 1 | <ul style="list-style-type: none"> Gas welding TIG welding MIG welding Micro plasma welding Brazing Spot welding MMA welding (rutile covered electrode) | <ul style="list-style-type: none"> Oxygen cutting machines Plasma cutting machines Resistance welding machines Machines for thermal spraying Bench welding |
| Class 2 | <ul style="list-style-type: none"> MMA welding (basic or cellulose-covered electrode) MAG welding (CO₂ mixed gasses) Self shielded flux cored arc welding Plasma cutting Gouging Oxygen cutting Thermal spraying | <ul style="list-style-type: none"> In confined spaces At overhead welding/ cutting or in comparable constrained positions |