

EN ISO 11612 – Clothing to protect against heat and flame.

The requirements apply to clothing intended for a wide range of application which offer limited flame spread and provide protection against various hazards including Radiant Heat, Convective Heat and splatters of Molten Metal. The pictogram is the same as the withdrawn EN531 standard. There are several fabric tests within this EN Standard and the results of the tests are represented by the pre-fix letters A, B, C, D, E and F. A number after these letters indicates the performance of the fabric within this test. If a (0) is shown, then the fabric has not been tested or does not achieve the lowest value attainable with the test.

General Requirement: The mechanical strength and heat resistance at a temperature of 180°C: the material shall not ignite or melt and shall not shrink by more than 5%.

Letter A

This test consists of applying a flame to a fabric sample for 10 seconds. To pass the test, the after flame & smoulder times and formation of holes must be within the tolerances within the standard. The application of a flame can take place in two ways:

Code Letter A1 Surface Ignition

Procedure A (leads to Class A1), the flame is applied horizontally (similarly to EN470 and EN531)

- No specimen shall permit any part of the lowest boundary of any flame to reach the upper or either vertical edges
- No specimen shall give hole formation of 5mm or greater in any direction, except for an inter-lining that is used for specific protection other than heat and flame protection.
- No specimen shall give flaming or molten debris
- The mean value of after flame time shall be $\leq 2s$
- The mean value of afterglow time shall be $\leq 2s$

Code Letter A2 Edge Ignition

Procedure B (leads to Class A2), the flame is applied laterally.

- No specimen shall permit any part of the lowest boundary of any flame to reach the upper or either vertical edges
- No specimen shall give flaming or molten debris
- The mean value of after flame time shall be $\leq 2s$
- The mean value of afterglow time shall be $\leq 2s$

Letter B

Convective Heat: determination of the heat transmission when exposed to flames. The sample is held above the flame and the rise in temperature on the topside of the sample is measured with a calorimeter. The length of time the sample can remain exposed before its

temperature rises by 24 °C is determined.

B1: 4 < 10 seconds, **B2:** 10 < 20 seconds, **B3:** 21 seconds and longer

Letter C

Exposure to Radiant Heat. In this test, a fabric sample is exposed to radiant heat (infrared rays). The temperature on the reverse (unexposed) side of the sample is registered using a calorimeter. Subsequently, the length of time the sample the sample can remain exposed before its temperature rises by 24°C is measured. The test procedure is the same as ISO 11611, but the classification is different:

C1: 7 < 20 seconds, **C2:** 20 < 50 seconds, **C3:** 50 < 95 seconds, **C4:** 95 seconds and longer

Letter D and E

D = Aluminium

E = Molten Iron

Determining the level of protection against spatters of molten metal. A membrane (with similar properties to human skin) is attached to the reverse of the fabric sample sequentially rising quantities of molten metal (Aluminium or Iron as applicable) are splashed on the sample. The quantity of molten metal which deforms the membrane is determined.

The classification for molten aluminium is:

D1: 100 < 200 grams, **D2:** 200 < 350 grams, **D3:** 350 grams and more

The classification for molten iron is:

E1: 60 < 120 grams, **E2:** 120 < 200 grams, **E3:** 200 grams and more

Letter F

This is a test to establish a value for contact heat.

The classification in this respect:

F1: 5 < 10 seconds, **F2:** 10 < 15 seconds, **F3:** 15 seconds and longer