

Protective clothing against heat and flame.

Test method: Assessment of clothing materials and material assemblies exposed to a radiant heat source

Reference number: EN 366

Status: European Standard - Test method

Scope: This standard specifies a test method to assess the behaviour (structural changes, heat transfer) of clothing materials and material assemblies when exposed to a radiant heat source, emitting a specific heat flux (in kW/m²).

TEST PRINCIPLE:

The radiant heat flux is generated by a panel of six electrically heated rods. The incident flux on the surface of the test sample is inversely proportional to the distance between the specimen and the radiant panel.

Hence a specific flux can be chosen by varying this distance.

Two test methods are used:

- Method A: the specimen is mounted in a frame and exposed to a specific heat flux. Structural changes in the specimen are recorded.
- Method B: the specimen is mounted on a calorimeter and exposed to a specific heat flux. The heat flux transmitted through the specimen is calculated by measuring the rise of temperature in the calorimeter.

Comments :

Radiant heat fluxes used in this standard are categorized as:

- low: 5 and 10 kW/m², representative for industrial heat, e.g. foundry workers.
- medium: 20 and 40 kW/m², representative for fire fighting.
- high: 80 kW/m², representative for emergency interventions in a fire, including short time penetration into the fire.

Expression of results :

- Method A: all visual changes in the structure of the test specimen
- Method B: heat transfer levels are determined from the temperature-time curve of the calorimeter:
 - T1: time (s) to first degree burns.
 - T2: time (in s) to second degree burns.
 - T3: time (in s) to reach a heat flux of 2.5 kW/m² on the back of the specimen.
 - heat transmission factor: the ratio (in %) between transmitted and incident heat flux.

Comments :

- Radiant heat: heat emitted as electromagnetic radiation, mainly infrared.
- Heat flux(kW/m²): the amount of energy (in kJ) per second and per square metre falling on or passing through a surface.
- Calorimeter: instrument to measure the heat energy absorbed by it; a calorimeter has a well defined heat capacity, i.e. the amount of energy can be calculated from the temperature rise in the calorimeter.