



## IS 16890: 2018 Textiles — Protective Clothing for Firefighters — Specification

Firefighters not only play a pivotal role to rescue human lives during fire accident but also save properties from extensive damage by extinguishing hazardous fires. It is one of the most life-threatening occupations that require intensive physical work in hazardous environment. The firefighting suit is one of the important parts of personal protective equipment (PPE) used by Fire fighters.

**Overview:** The standard covers the design, performance, and testing methodologies for garments intended to safeguard firefighters during fire-related incidents and associated activities where heat and flame hazards exist. The standard specifically focuses on protecting the upper and lower torso, neck, arms, and legs, excluding the head, hands, and feet. It encompasses various configurations, including single outer garments, two-piece suits, and layered ensembles.

**Components:** Firefighter suits consist of an outer shell, inner shell (moisture and thermal barriers), and inner liner.

The quality and performance expectations are centered around: Safety (barrier against heat, flame, and potential chemical splashes), Durability, Functionality and Visibility which are met by the following measures mentioned in the standard:

- **Material Specifications:** It sets specific requirements for the materials used in constructing the different layers of the clothing, including the outer shell, moisture barrier, and thermal barrier. The standard mandates minimum performance levels for properties like flame resistance, heat transfer, tensile strength, tear strength, and resistance to water and chemical penetration.
- **Design Requirements:** The standard dictates specific design features to ensure functionality and safety. This includes guidelines for seam construction, closure systems, sleeve ends, and the incorporation of retroreflective elements. The clothing is designed for ease of cleaning and maintenance, crucial for hygiene and prolonged use.
- **Testing Procedures:** Comprehensive testing protocols are outlined to assess the performance of the clothing against various hazards. These tests cover aspects such as flame spread, heat transfer, residual strength after heat exposure, water penetration, and dimensional stability after cleaning.
- **Labeling Requirements:** The standard mandates clear and durable labeling that provides crucial information about the garment, such as the manufacturer, size, care instructions, and compliance with the standard. Additionally, manufacturers must provide instructions and information on cleaning, maintenance, repair methods, and warranty details, along with training materials covering safety considerations, storage conditions, decontamination procedures, and retirement considerations.
- It also provides annexures for checking of basic ergonomic features of protective clothing —practical performance tests and requirements for visibility.

**By enforcing these stringent requirements and testing procedures, IS 16890:2018 aims to assure firefighters that their protective clothing is reliable, durable, and effective in safeguarding them from the inherent risks associated with their profession.**