

INHERENT FLAME-RETARDANCY

The term flame retardancy defines the reaction of a material to the impact of exposure to a flame. The phrase 'retardancy' is defined as slowing the continuation of flaming down or removing the propensity of a fabric to continue burning.

This can be achieved in two ways:-

- 1) Melting technology, where the fibre or fabric is designed to melt rapidly at a temperature below that at which it would catch fire. Here the fabric forms a hole rapidly, thereby removing the fabric as a source of fuel. An example would be FR polyester: these fabrics hole very quickly and are perfect solutions for fabrics which do not cover a substrate that can be damaged (such as skin) or ignited (such as fillings in furnishings or bedding items), and so curtains and blinds can be made of such materials. It is further desirable to minimise any tendency to form molten or flaming droplets which could cause injury or carry a fire to the floor and ignite any coverings. Such fibres and fabrics CANNOT be used in PPE, for very obvious reasons.
- 2) Charring technology: here the fabric is designed to withstand the impact of naked flame and to form or maintain a barrier between flame and substrate (such as skin). This is the technology of Protal, and is the only realistic system to be used for PPE.

The 'barrier' technology can be achieved in two ways:-

- (a) By topical application of a chemical treatment such as Proban or Pyrovatex. These can be of variable durability and there is always a danger of physical or solvent/aqueous erosion which will remove or diminish the effect. Such products are usually described as 'topical' treatments.
- (b) By using an Inherent FR system. Here - and therefore can only really be applied to synthetic fibres - the FR technology is arrived at by incorporation of a flame-retardant substance into the raw material mix prior to extrusion or formation of the fibre. This ensures that the FR performance is locked into the basic textile fibre and is carried - without any diminution - through the various textile processes to finished fabric. The FR technology and therefore the performance and effect CANNOT be removed by physical erosion or by solvent or aqueous scouring/laundrying.

The use of inherently flame-retardant (IFR) materials is always considered to be superior to that of topical treatment due to the likelihood of rubbing or washing away the effect, and also the impact the surface-only treatment may have on adverse skin reactions and any impact on the environment - no matter how 'durable'.

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