Workers in utilities, oil, gas, petrochemical and steel industries face the risks of severe or fatal burn injuries every day in the course of their work. Ignition sources such as flames or electric arc pose a serious workplace hazard from which workers must be protected.

Everyday work clothing won’t do it. Such clothing readily ignites and continues to burn under such conditions, offering workers no real protection against receiving serious burn injuries on the job. In fact, research shows that the majority of severe and fatal burn injuries occur because the individual’s clothing ignites and continues to burn, rather than because of the exposure itself.

How then do you ensure workers are adequately protected from workplace ignition sources in their place of work? How can we minimise burn injuries on the job?

**UNDERSTANDING THE DYNAMICS OF FLAME RESISTANCE IS A GOOD START**

All fabrics made of natural fibres, as well as most synthetic fabrics, will ignite readily and continue to burn when they are exposed to an ignition source. Resistance to ignition and burning are not usually found in standard fabrics.

Normal fabrics burn outward from the point of ignition, spreading and increasing flames, and continuing to burn even when the ignition source has been removed, until they are extinguished or the fabric is completely consumed. Synthetic fabrics pose additional risks, as they melt and drip when they burn, causing severe contact burns to the skin.

Flame resistant (FR) fabrics and garments are designed to resist ignition, they are simply harder to light. They do not significantly protect from burn injuries at the point of contact with the ignition source, but they are harder to ignite and reduce flame spread, therefore reducing the extent and severity of burns. In addition, they prevent the spread of flames and self-extinguish almost immediately when the ignition source is removed. Flame resistance properties are usually achieved by treating fabric with a flame retardant, which is a chemical substance with ignition resistance properties.

The level of protection provided by FR fabrics typically depends on fabric weight and composition, which impact the extent of thermal protection provided and specific flame resistance characteristics.

100% cotton is often erroneously perceived as flame resistant, but like other natural fibres, it will ignite and continue to burn if exposed to an ignition source. This perception may have arisen because workers are advised to always wear cotton or natural fibre undergarments to prevent possible injury from melting synthetics. Workers still need to wear appropriate flame resistant garments on the job for maximum protection.
If flame resistant fabric garments become contaminated with flammable materials such as solvents, their effectiveness is markedly reduced. Contaminated garments should be removed immediately and cleaned. If laundering or dry cleaning can’t remove the contaminant, the affected garments should be replaced with fresh FR clothing.

So then, it is important to take a systematic approach when evaluating a protective clothing programme.

Employers must identify all workplace risks and hazards and protect their employees accordingly. When flame resistant garments are selected, consider factors such as specific workplace activities and hazards, wearer comfort requirements, durability, appearance, and laundering or servicing. Another selection factor is the design of the garment. It can be important in adding functionality as well as protection.

DETERMINE THE BURN HAZARD
Different types of burn hazards have different dynamics, which govern the choice of fabric as well as the garment design. Types of burn hazards include convective heat, radiant heat, acids, molten metal splash or spark, electric arc, and flash fires or explosions.

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