TYPES OF PROTECTIVE CLOTHING

In general, protective clothing is designed for the following:

- **Mechanical hazards**
  It protects users from mechanical injury, including punctures, cuts and knocks. This kind of clothing is made from materials such as Kevlar® and synthetic fibres.

- **Heat and/or fire**
  It protects against all kinds of thermal injury, including flames, heat transfer (convection, radiation and conduction), and flying hot and/or molten matter.

  According to the protection afforded by this kind of clothing, the following protection parameters and levels are established:

PROTECTION	LEVEL (from lowest to highest protection)
Limits flame spread	from 0 to 1
Convective heat resistance	From 1 to 5
Radiant heat resistance	From 1 to 4
Resistant to splashes of molten aluminium	From 1 to 3
Resistant to splashes of molten iron	From 1 to 3

- **Chemical hazards**
  This kind of clothing is made from materials that are specific to the chemical compound against which protection is sought. Therefore, levels of protection (1 = minimum protection, 6 = maximum protection) must be established for each combination of clothing material/chemical product.

The following classification is established for clothing that protects against chemical hazards:

TYPES	PROTECTION
Type 1	Impervious to chemical products in the form of gases or vapour (gas-tight). Covers the entire body, and includes gloves, boots and respiratory protection equipment.
Type 1 a	Respiratory protection equipment inside the suit.
Type 1 b	Respiratory protection equipment outside the suit.
Type 1 c	Connected to an airline.
Type 2	Similar to Type 1c, but the seams are not sealed (not gas-tight). All are made from non-breathable, impermeable materials.
Type 3	Have liquid-tight connections against liquid chemicals from pressurised jets. All are made from non-breathable, impermeable materials.
Type 4	Have spray-tight connections against liquid chemicals. May be made from breathable or non-breathable materials, but must be impermeable.
Type 5	Impervious to chemical products in the form of solid particles. Made from breathable materials and the protection level is measured by resistance to the penetration of solid particles.
Type 6	Provide limited protection against small splashes of liquid chemical products. Made from breathable materials and the protection level is measured by resistance to the penetration of liquids.

- **Cold and bad weather**
  These types of clothing are usually made from natural or synthetic textiles coated in a layer of impermeable material (PVC or polyurethane) or treated to obtain a specific kind of protection.
- **Non-ionising and ionising radiation**
  For non-ionising radiation, textiles with high electrical conductivity and static dissipation properties are used.
  For ionising radiation, impermeable clothing is used with materials that act as a screen.
- **High visibility**
  Protection is achieved using fluorescent materials or materials that have suitable retro-reflective properties. This type of protective clothing is divided into three classes: class 3 has the highest visibility level and class 1 has the lowest.
- **Electric and anti-static hazards**
  In low-voltage environments, the main materials used are cotton or cotton/polyester mixes, while in high voltage environments, conductive clothing is used.
  Anti-static clothing is used in situations where electric discharges due to the accumulation of static electricity in clothing could be highly dangerous (explosive and deflagrating atmospheres).
  This type of clothing is made from conductive materials, such as polyester textiles with stainless steel microfibers and synthetic fibres with a carbon core.

PROTECTION LEVELS

Protection levels are numbers that indicate the categories or ranks of protection, and are directly related to the results of tests described in the technical regulations, to assess whether protective clothing meets the required standards. Consequently, they indicate the degree of protection that the clothing provides. Depending on how it works, protective clothing must protect against the following risks:

- **Injury to the body due to external agents**
  - Mechanical hazards (sharp objects, etc.)
  - Thermal hazards (heat, cold, splashes of molten metal, flames, sparks, etc.)
  - Chemical hazards (acids, bases, solvents, gases, powders, etc.)
  - Electrical hazards (contact with electrical conductors and electrostatic discharges)
  - Radiation and contamination hazards (X rays, UV rays and radioactive substances)
  - Biological risks (pathogenic agents, etc.)
- **Health hazards or discomfort due to the use of protective clothing**
  - Hazards caused by discomfort at work due to the use of protective clothing.

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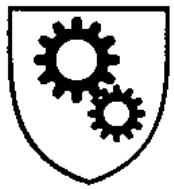
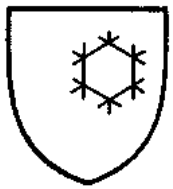
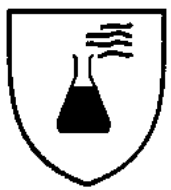
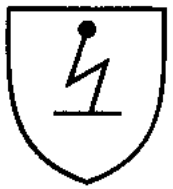
PPE: PROTECTIVE CLOTHING

MARKING

- The CE marking.
- The name, trademark or any other means of identifying the manufacturer or authorised representative.
- The name of the type of product (the tradename or code that enables the product to be identified in the manufacturer's range or that of their authorised representative).
- The size and number of the harmonised regulation used to assess the product's conformity with essential health and safety requirements.
- A pictogram and, if necessary, the protection levels and a care label.

The pictograms corresponding to the various hazards are as follows:

 Moving parts	 Cold	 Heat and fire	 Chemical	 Electrostatic discharges
 Chainsaw	 Radioactive contamination	 Bad weather	 Low visibility	

1 3 2 2 1

Protection levels	
1	Resistant to splashes of molten iron
3	Resistant to splashes of molten aluminium
2	Radiant heat resistance
2	Convective heat resistance
1	Limits flame spread

SELECTION: RECOMMENDATIONS

1. Before personal protection equipment is purchased, the ***table of risks*** should be completed to obtain more accurate criteria.
2. The ***manufacturer's information booklet*** should be considered, which must include the following useful information:
   - Name and address of manufacturer or authorised representative
   - Available sizes and classes of protection
   - Explanation of markings
   - Use, maintenance, cleaning, disinfection and expiry period or service lifetime.
3. Protective clothing for working with machinery must have sleeve and trouser cuffs that fit the body tightly. Buttons and pockets must be covered.
4. Clothing for welding protects against splashes of molten metal, brief contact with flames and UV radiation. It is usually made from natural fibres with fireproof treatment, or heat-resistant leather.