GET TO GRIPS WITH HAND PROTECTION

Health & Safety for your hands
Hands at work are extremely vulnerable to a wide range of hazards which include cuts, blows, chemical attack and temperature extremes. With industry’s increasingly complex and sensitive manufacturing and handling processes, there is a growing insistence on the use of “job fitted” gloves that meet each user’s specific requirements.

The importance of glove maintenance
Contaminated and damaged gloves may fail to protect the hands from the very hazard they were designed for. Effective protection is maintained by regular replacement of the gloves. Check the condition of the gloves, inside and out before use.

Your guide to safety standards and choosing the right hand protection

European Standards
CE Implies that the gloves comply with the basic requirements laid down by the EC Regulation: Personal Protective Equipment.

Simple Design (Category I)
For areas of ‘minimal risk’ where the effects of not wearing a glove are easily reversible or superficial. Such products are self-certified.

Intermediate Design (Category II)
For areas of specific risk i.e. mechanical risks. Such products will have been EC type tested against European test methods and certified by a notified body.

Complex Design (Category III)
For areas/applications that can seriously or irreversibly harm the health. Such products, in addition to the CE type test, will also have to be either produced under an approved quality system OR be type tested on an annual basis.

Safety standards symbols and what they each represent

What to look out for
Each glove has its own individual rating for each standard it qualifies for. Against each product there will be a prominent ‘standards box’ (as per the example shown on the left) clearly displaying the particular safety standards that the glove complies with. This will help you quickly see what you need to know about the glove, helping you shop more efficiently.
Introducing BS EN ISO 21420

Manufacturers of PPE need to ensure that the materials from which their products are made do not adversely affect the health or safety of users. The publication of the new glove standard, **EN ISO 21420** which replaces EN 420 builds on this and responds to the growing trend in standardization to address the topic of “innocuousness”. It will also take into consideration the requirements of the EU PPE Regulation as ISO 21420 will help address the Essential Health and Safety aspects of Annex II, where PPE must be made so that it’s free of inherent risks and nuisance factors and must not be made from materials that can adversely affect the health and safety of users.

**BS EN ISO 21420 – a summary**

The new ISO 21420 will bring a new limit level of DMFa (dimethylformamide) in polyurethane-coated (PU) gloves; it will also provide further alignment with the REACh (Registration, Evaluation, Authorisation and Restriction of Chemicals) legislation on hazardous substances or substances of very high concern.

Protective gloves are frequently manufactured with the use of dozens of chemicals and it is the manufacturer’s responsibility to ensure the products they place on the market are safe. This could prove challenging not only to the manufacturer but also to the body testing and approving the particular PPE, in trying to determine whether it satisfies the provisions of the PPE Regulation.

For this reason, the new standard pays close attention to alignment with REACh, by adding requirements for nickel release, undetectable carcinogenic amines in azodyes and the aforementioned DMFa content.

**Key changes manufacturers need to be aware of include:**
- Introduction of a new pictogram for electrostatic properties EN 16350
- Removal of the protein content test in natural rubber gloves
- Introduction of date of manufacture markings
- Removal of minimal glove length requirements, unless required by a specific standard i.e. welding gloves
- Other subtle changes concerning information for users, additional information on donning/doffing, product integrity checks before use

**Other key requirements covered by EN ISO 21420 include:**
- Gloves shall be designed and manufactured to provide protection when used in accordance with manufacturer’s instructions, without harm to the end user.
- Protective gloves shall not adversely affect health and hygiene of the end user (innocuousness).
- Chromium VI content in leather no more than 3mg/kg (Test method EN 17075).
- Any metallic materials that could come into contact with the skin shall not release nickel in more than 0.5μg/cm² per week (Test method EN 1811).
- Azo colorants which release carcinogenic amines shall not be detectable (Test method ISO 17234-1 leather or ISO 14362-1 textile).
- pH value shall be between 3.5-9.5 (Test method ISO 4045 leather or ISO 3071 textile).
- DMFa (dimethylformamide) shall not exceed 0.1% weight/weight (Test method prEN 16778).
- The levels of performance should be based on the lowest results obtained before and after cleaning cycles (consideration of care instructions for testing).
- For gloves worn in ATEX environments, the electrostatic properties shall be tested (Test method EN 16350).

**Important changes covering glove marking**

Each protective glove shall be marked with:
- Manufacturer’s name and postal address
- Glove designation
- Size designation
- Date of manufacturing (month and year)
- Relevant pictograms and corresponding level(s) of protection
- The CE marking

*If marking on glove is not possible, due to the characteristics of the product then the marking shall be affixed to the first packaging enclosure.*
What the symbols represent

**EN 388** – This standard applies to all kinds of protective gloves giving protection from mechanical risks, in respect of physical problems caused by abrasion, blade cut, tearing, puncture or impact. This standard also covers risk of electrostatic discharge.

**EN ISO374-5:2016** – Gloves have been tested for penetration (leakage) using test method in EN 374-2:2014 but do not need to be tested against chemical permeation. If the word VIRUS appears under the symbol, this signifies protection against bacteria, fungi and viruses. If the word Virus is not present, then only protection against bacteria and fungi is claimed. Such gloves may not protect against all viruses.

**EN ISO374-1:2016/Type A** – The permeation performance shall be at least level 2 (minimum 30 mins breakthrough time) against a minimum of 6 test chemicals.

**EN ISO374-1:2016/Type B** – The permeation performance shall be at least level 2 (minimum 30 mins breakthrough time) against a minimum of 3 test chemicals.

**EN ISO374-1:2016/Type C** – The permeation performance shall be at least level 1 (minimum 10 mins breakthrough time) against a minimum of 1 test chemicals.

**EN 511** – This standard applies to gloves which protect the hands against convective and contact cold.

**EN 407** – This standard specifies thermal performance for protective gloves against heat and/or fire.

**EN 407**

Performance Level

<table>
<thead>
<tr>
<th>Contact Temperature °C</th>
<th>Threshold Time Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>&gt;15</td>
</tr>
<tr>
<td>250</td>
<td>&gt;15</td>
</tr>
<tr>
<td>350</td>
<td>&gt;15</td>
</tr>
<tr>
<td>500</td>
<td>&gt;15</td>
</tr>
</tbody>
</table>

**EN 659** – This standard defines performance requirements for gloves designed to protect fire fighters against heat and flames.

**EN 421** – This standard lays down test methods and performance criteria for gloves offering protection against ionising radiation and radioactive contamination.

**EN 455** – Medical gloves for single use. If a glove is to be used for food handling, it is required to carry either the words 'for food use' or this symbol.

**EN 1082** – Cuts and stabs by hand knives

**EN 381** – Chainsaw Protection

**EN 16350** – Electrostatic properties

---

What the numbers represent

**3443CP**

A B C D E

**Mechanical Hazards: EN 388**

Performance Level

(a) Abrasion resistance 0-4
(b) Circular blade-cut resistance 0-5
(c) Tear resistance 0-4
(d) Puncture resistance 0-4
(e) Straight blade cut (TDM) resistance A-F (f) Impact resistance P if passes

An "X" can be shown in place of any of the first 5 digits underneath the pictogram, where the test was either not carried out, not required or not suitable. The same method applies to these two standards below also.

**Thermal Hazards: EN 407**

Performance Level

(a) Burning behaviour 0-4
(b) Contact heat 0-4
(c) Convective heat 0-4
(d) Radiant heat 0-4
(e) Small splashes of molten metal 0-4
(f) Large splashes of molten metal 0-4

**Contact Heat**

A sample is taken from the palm area of a glove. The outside of the glove is put on a hot surface and the temperature of the inside of the glove is then monitored. The temperature on the inside of the glove must take 15 seconds or more to rise by 10°C from room temperature.

**EN 407**

Performance Level

<table>
<thead>
<tr>
<th>Contact Temperature °C</th>
<th>Threshold Time Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>&gt;15</td>
</tr>
<tr>
<td>250</td>
<td>&gt;15</td>
</tr>
<tr>
<td>350</td>
<td>&gt;15</td>
</tr>
<tr>
<td>500</td>
<td>&gt;15</td>
</tr>
</tbody>
</table>

**EN 511: Cold**

Performance Level

(a) Resistance to convection cold 0-4
(b) Resistance to contact cold 0-4
(c) Permeability to water 0-1