

EUROPEAN STANDARDS OF PROTECTIVE GLOVES



Most European standards concerning protective gloves are represented by a shield-shaped pictogram (facing risk protection symbol) associated with a list of performance levels obtained at one or several tests in laboratory.

- [EN420](#) : general requirements
- [EN388](#) : mechanical risks
- [EN511](#) : risks with cold
- [EN407](#) : thermal risks heat and fire
- [EN659](#) : fireman gloves
- [Pr EN12477](#) : gloves for welders
- [EN374-2](#) : micro-organic risks
- [EN374-3](#) : chemical risks
- [ISO 10819](#) : vibrations and impacts of mechanical origin

Levels range from 0 to 4, 5 or 6. 0 being an insufficient result in regards to the standard criteria and 4, 5 or 6 the higher level so the more effective one. A “X” in a test result means that this test is not feasible for this PPE or that it has not been carried out. Only one test result superior to 0 in one standard is sufficient for the manufacturer to require the conformity for this standard.

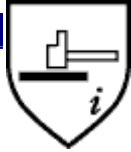


We propose to you in the rubric **choice of help** performances tables with direct step reading which allow you to appreciate resistance qualities of every glove according to these different standards.

EN420 standard : general requirements

It specifies the general requirements as regards to :

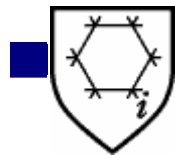
- Manufacturer identification and product marking
- Innocuousness (e.g. : pH of the materials the most neutral)
- Respect of agreed sizes (see [size measurements table](#))
- Dexterity : it is advisable that a glove brings as much dexterity as possible according to the intended use.
- Glove composition.
- Packing, storage, maintenance and cleaning
- Information to the user on instructions for use whatever the PPE category : performances, pictograms, uses, use precautions, available sizes range...



EN 388 standard : : mechanical risks

The **EN388** standard is applicable to all types of protective gloves regarding physical and mechanical stresses by abrasion, cutting by blade, puncture and tearing. This standard is not applicable to anti-vibratory gloves.

<i>Performance level</i>				<i>Requirement</i>
0 to4	0 to 5	0 to 4	0 to 4	Resistance to puncture : : necessary force to pierce the sample with a standardised awl. Resistance to tearing necessary force to tear the sample Resistance to cutting by blade : number of cycles necessary to cut the sample at a continuous speed. Resistance to abrasion : number of cycles necessary to damage the sample at a constant speed.



EN 511 standard : risks by cold

The **EN511** standard specifies the requirements and test methods of the protective gloves against cold transmitted by convection or conduction up to -50°C . This cold can be bound to climatic conditions or to an industrial activity. The specific values of the different performance levels are determined according to the requirements peculiar to every category of risk or to every special application field.

Products tests can only be carried out for performance levels and not for protection levels.

<i>Performance level</i>			<i>Requirement</i>
0 to 4	0 to 5	0 to 1	waterproofness : indicates whether or not penetration after 30 minutes Resistance to contact with cold: indicates whether or not penetration after 30 minutes Resistance to convective cold : indicates whether or not penetration after 30 minutes.



EN 407 standard : : thermal risks heat and fire

The **EN407** standard specifies test methods, general requirements, thermal performance levels and the marking of protective gloves against heat and / or fire. It is applicable to all the gloves which must protect hands against heat and / or flames under one or several of the following forms : fire, contact heat, convective heat, radiant heat, small projections of molten metal or big projections of molten metal.

Test can be only carried out for performance levels and not for protection ones.

Performance level

1 to 4 1 to 4 1 to 4 1 to 4 1 to 4 1 to 4



Requirement

Resistance to projections of molten metal in big quantities : quantity of projections necessary to cause deterioration

Resistance to small projections of molten metal : quantity of projections necessary for the glove to rise to a certain temperature.

Resistance to radiant heat : time necessary for rising to a given temperature level.

Resistance to convective heat : time during which the glove is able to hold the transfer of the flame's heat.

Resistance to contact heat : temperature (in the range 100°C to 500°C) at which the one who wears the glove will not feel any pain (for a period at least equal to 15 seconds).

Resistance to flammability : time during which the material keeps burning and continues to consume itself after the ignition source has been removed.



EN 659 standard (protective gloves for firemen)

This standard is applicable only to protective gloves for firemen for the fight against fire, research operations and rescue. It specifies test methods and the minimal performances of these gloves.

(for example the minimal levels of mechanical resistance to the EN388 standard are: 2,2,2,2).

PrEN 12477 standard (protective gloves for welders)

This project of standard specifies the requirements and test methods for the gloves used for manual welding of metals, cutting and related techniques. The welders' gloves are classified into two categories: B when a big dexterity is required and A for others welding processes.



EN 374-2 standard : : micro-organisms risks

The EN374-2 standard specifies a test method for the resistance to penetration of the protective gloves against chemicals or micro-organisms. When the gloves resist to the penetration and when tested according to this section of the EN374 standard, they constitute an efficacious barrier against microbiological risks.

Performance level	Requirement
0 or 1	Penetration indicates whether or not the product resists to water and air penetration



EN 374-3 standard : chemical risks

The EN374-3 standard cares, in case of continuous contact, to determine the resistance of the materials constituting the permeation gloves, from non-gaseous, potentially dangerous chemicals. It is therefore advisable to insist on the fact that this test does not account for conditions liable to be met during service, and it is also recommended to use the test results, which have an essentially relative value, only to compare the materials by high categories of time of passage.

Performance level	Requirement
0 or 1	Permeation : indicates the time necessary for a dangerous product to go across the protective film barrier by permeation.
0 or 6	Penetration : indicates whether or not the product resists to water and air penetration.

EN ISO 10819 standard

Vibrations and impacts of mechanical origin for arms and hands

Method of measurement and evaluation of the vibrations transmission factor through a glove to the palm of the hand.

Established by the European Committee of Standardisation (ECS) to answer the growing demand of protection against the risks of hands/arms vibrations syndrome (HAVS) caused by the exposure to risks of vibrations transmitted by hands.

The measurements are carried out at palm level with the exclusion of the fingers. The standard specifies primarily, with the current knowledge, that the gloves are unable to deliver a significant reduction of the vibration frequencies inferior to 150 Hz.

Some gloves can even increase these frequencies, but it is important to remind that keeping the hand warm and dry are some of the important properties of a glove and are equally useful for the limitation of some vibrations induced effects.

Measurement only of the transmission factor according to the EN ISO 10819 standard is not sufficient to evaluate the health risk factor due to vibrations.

Definition of the standard on vibrations transmission :

It is the vibrations transmission factor (one ratio) measured at the surface of the non-protected hand and on the anti-vibratory glove's palm while holding a vibrating tool handle.

Transmission values superior to 1 indicate that the glove increases the vibrations, the values inferior to 0.6 indicate that the glove reduces the vibrations.

Tests are carried out with frequencies ranging from 31.5 Hz to 1250 Hz representative of the most usual vibrating tools.

- middle frequencies spectrum : 31.5 Hz to 200 Hz
- high frequencies spectrum : 200 Hz to 1250 Hz

To comply with the EN ISO 10819 standard we must meet :

- transmission in middle frequencies : TR_m is < 1
- transmission in high frequencies : TR_h is < 0.6