



FLEX & GRIP® : The range of composite insulating gloves for working in full safety without leather protectors.

Manufactured according to the standards (EN-60903 & IEC-60903), the range has been created in taking into consideration the expectations from users.

Then, the range FLEX & GRIP® is innovative in term of products, seeing that we propose :

- One type of « low voltage » composite gloves for any live working under 1 000 volts : the **FLEX & GRIP® BT/LV**,

- The **class 1**, tested to 10 000 volts for a max. use voltage of 7 500 volts

- The **class 2** and the **class 3** (respectively for max. use voltages of 17 000 and 26 500 volts).

These products are not defined by the EN-60903 and the IEC-60903, so we based the characteristics on these standards and have completed it with our own specification.

FLEX & GRIP® is also innovative by the selection of raw materials which grant a good suppleness, in spite of the thickness required to protect entirely against the mechanical hazards. In the same way, the chemical formula of the outside layer gives an exceptional « grip », even in wet conditions.

To reduce the effects of sweating, each pair of FLEX & GRIP® is sold with a pairs of cotton liner. Separated, the cotton liners may be replaced, thus limiting bacteriological problems associated with residual humidity caused by sweating.



FLEX & GRIP® RANGE

Electrical requirements (routine tests and sampling tests in alternating current)

Designation	Max. use voltage (in volts)	Proof test voltage (in volts)	Withstand voltage (in volts)
GLE 360 Class 0	1 000	5 000	10 000
FLEX & GRIP® Class 1	7 500	10 000	20 000
FLEX & GRIP® Class 2	17 000	20 000	30 000
FLEX & GRIP® Class 3	26 500	30 000	40 000
FLEX & GRIP® Class 4	36 000	40 000	50 000

1/ In the choice of class, it is important to define the network nominal voltage which must not exceed the maximum operating voltage. For multiphase networks, the network nominal voltage is the voltage between phases.

2/ The proof test voltage is the one applied to gloves during the individual routine tests.

3/ The withstand voltage is the one applied during the validation tests after the gloves have been conditioned for 16 hours in water and after a 3-minutes test at the proof voltage.

Summary Table

Designation	Length	Categories	Thickness in mm *	Sizes available	Colour
GLE 360 Class 0	36 cm	AZC	1.0	* 8-9-10-11	Yellow
FLEX & GRIP® Class 1	41 cm	RC	2.6	8-9-10-11	Red
FLEX & GRIP® Class 2	41 cm	RC	3.1	8-9-10-11	Red
FLEX & GRIP® Class 3	41 cm	RC	3.6	8-9-10-11	Red
FLEX & GRIP® Class 4	41 cm	RC	3.8	8-9-10-11	Red

*Obtaining a category authorises an additional thickness of 0.6mm

Signification of category letters : R = Resistance to acid, ozone and oil - C = Resistance to very low temperature.

Manufacturer of insulating gloves for live working

Ageing requirements (sampling test)

Conditioning of the gloves in an air oven at $70 \pm 2^\circ\text{C}$ for 168 hours :

- The elongation at break values must be at least equal to 80% of those of non-conditioned gloves.
- The tension set must not exceed 15%.
- The gloves must pass the proof test voltage and withstand test voltage.

Thermal requirements (sampling test)

1 Resistance to low temperature :

conditioning of gloves for 1 hour at $-25 \pm 3^\circ\text{C}$. The tests are satisfactory if no tearing, breaking or cracking after folding is visible on the cuff and if the gloves pass the proof test voltage and withstand test voltage.

2 Flame retardancy test :

Application of a flame for 10 seconds at a finger tip. The test is satisfactory if, after 55 seconds, the flame has not reached the marker located 55mm away at the other end.

Mechanical requirements (sampling test)

- Average tensile strength : $\geq 16 \text{ MPa}$
- Average elongation at break : $\geq 600\%$
- Tension set : $\leq 15\%$

The additional tests and performance levels to be obtained are as follows :

- Resistance to abrasion : $\leq 0.05 \text{ mg/t}$ (no equivalence level according to the EN-388 standard)
- Resistance to cutting : > 2.5 (equivalence level 2 according to EN 388)
- Tearing resistance : $> 25 \text{ N}$ (equivalence level 2 according to EN 388)
- Puncture resistance : $> 60 \text{ N}$ (equivalence level 2 according to EN 388)

Special properties (sampling test)

1 Resistance to acid :

conditioning of gloves by immersion for 8hr at $23 \pm 2^\circ\text{C}$ in a sulphuric acid solution at 32° Baume

- The tensile strength and elongation at break values must be at least equal to 75% of those of non-conditioned gloves.
- The gloves must pass the proof test voltage and withstand test voltage.

2 Resistance to oil :

conditioning by immersion in oil (liquid 102) for 24 hr at $70 \pm 2^\circ\text{C}$

- The tensile strength and elongation at break values must be at least equal to 50% of those of non-conditioned gloves.
- The gloves must pass the proof test voltage and withstand test voltage.

3 Resistance to ozone :

conditioning of gloves in a chamber for 3 hr at $40 \pm 2^\circ\text{C}$ and in a 1 mg/m^3 ozone concentration

- The gloves must not present any cracking
- The gloves must pass the proof test voltage and withstand test voltage.

4 Resistance to very low temperatures :

conditioning of gloves for 24 hours at $-40 \pm 3^\circ\text{C}$. The tests are satisfactory if no tearing, breaking or cracking after folding is visible on the cuff and if the gloves pass the proof test voltage and withstand test voltage.

Packaging

Each pair of gloves is packaged in a different coloured opaque sachet depending on its class of protection.

The following information is given on the packaging : class, size, categories, type of cuff, length, test date, manufacture batch number and validation batch number

Marking

