

Electrical faults

Overcurrent

The current (or the power) absorbed by a load is greater than the current (or the power) that can be supplied (or supported) by the electrical circuit.

In the event of overcurrents, the damage is not immediate but occurs after a certain period of time, that is proportional to the amount of excess current or power.

Joule heating

Joule heating is the process by which the passage of an electric current through a conductor produces heat.

$$P = R \cdot I^2$$

Useful when you need to produce heat: electronic cigarettes, food processing, phon, and...?

In electrical installations Joule heating is **harmful!**

Short-circuit

A short-circuit occurs when phase and neutral come into contact. The only resistance is the one introduced by the wire so we have an high current flow.

How do you calculate the resistance of a wire?

Do you remember?

Ohm's second law:

$$R = \rho \cdot \frac{L}{A}$$

ρ = resistivity, depends on the material of the conductor and its temperature.

l = width of the conductor.

A = area of the transversal section.

Discussion topic #1

Have you ever experienced the electrical panel switching off because of a current overload?



Discussion topic #2

What kind of power line fault could you mention?



Discussion topic #3

What happens if someone is involved in a short-circuit?



Homework

Take a photo of the electrical panel located in your home!