RESISTANCE AND IMPEDANCE

WHAT SLOWS CURRENT DOWN, AND WHY DOES IT MATTER?

Resistance	**Opposition to current flow.** Measured in **ohms, Ω**. Symbol `R`.
Impedance	Opposition to current in an **AC** circuit only (never DC). Symbol `Z`, also in ohms. It accounts for loads, such as the inductor in a fluorescent fitting, that shift current and voltage out of step. You'll meet **Ze** and **Zs** in fault loop impedance testing, and **R** when testing continuity.

Think of rocks in a stream: the water can't flow straight and fast, so it slows down. Every conductor has resistance, and so do cables, loads and your body. **Increase resistance and current goes down**, as long as the voltage stays the same.

BEST CONDUCTORS	WHY IT MATTERS
1. Silver	Lowest resistance, but far too expensive to use in cable
2. Copper	Second best and cheap, so it's what cables use. Aluminium is also used, for example in concentric supply cables.
3. Gold	Doesn't tarnish, so it's used to plate contacts

- **Low resistance is good** in neutrals and earth conductors (CPCs). If there's a fault, enough current has to flow to trip the protective device quickly.
- Your body has resistance too, and it's **much lower when wet**, for example straight out of the shower. That's why wet skin is so dangerous.
- A protective device (breaker or fuse) is there to **protect the cable** from carrying too much current. More current means more heat.

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