

Introduction to Electrical installation

Despite competition from other materials, copper remains the preferred electrical conductor in nearly all categories of electrical wiring.

Aluminium conductors: *Aluminium wires and cables*

Aluminium wire was common in some countries residential wiring from the late 1960s to the mid-1970s due to the rising cost of copper. Because of its greater resistivity, aluminium wiring requires larger conductors than copper.

Aluminium conductors were originally used with wiring devices intended for copper conductors. This practice was found to cause defective connections unless the aluminium was one of a special alloy, or all devices — breakers, switches, receptacles, splice connectors, wire nuts, etc. were specially designed for the purpose.

Aluminium conductors are still used for bulk power distribution and large feeder circuits, because they cost less than copper wiring, and weigh less, especially in the large sizes needed for heavy current loads. Aluminium conductors must be installed with compatible connectors.

Modern wiring materials

- Modern non-metallic sheathed cables, such as Types PVC / PVC and NYY (German) cables, consist of two to four wires covered with thermoplastic insulation, plus a bare wire for grounding (bonding), surrounded by a flexible plastic jacket.
- Special versions of non-metallic sheathed cables, such as Type PVC insulated PVC sheathed, are designed for direct underground burial (often with separate mechanical protection) or exterior use where exposure to ultraviolet radiation (UV) is a possibility. These cables differ in having a moisture-resistant construction, lacking paper or other absorbent fillers, and are formulated for UV resistance.
- Rubber-like synthetic polymer insulation is used in industrial cables and power cables installed underground because of its superior moisture resistance.
- Generally, single conductor building wire in small sizes is solid wire, since the wiring is not required to be very flexible. Building wire conductors larger than 6 mm² (10 AWG) are stranded for flexibility during installation, but are not sufficiently pliable to use as appliance cords.
- Cables for industrial, commercial, and apartment buildings may contain many insulated conductors in an overall jacket, with helical tape steel or aluminium armor **AWA**, or steel wire armour **SWA**, and perhaps as well an overall PVC or lead jacket for protection from moisture and physical damage.