

Household Load to Wire-Size Selection Guide

Which copper wire size (sq mm) to use for common Indian household circuits and appliances.

Pick the wire size from the load it has to carry. The sizes below assume **230 V single phase, copper conductor and reasonably short runs**. For long cable runs, go one size up to keep voltage drop within 3% (see the voltage-drop table).

Circuit / appliance	Typical load	Recommended copper wire
Lighting & fan circuit	up to ~0.8 kW	1.0 – 1.5 sq mm
5 A socket circuit	up to ~1 kW	1.5 sq mm
15 / 16 A power socket	up to ~3 kW	2.5 sq mm
Geyser / water heater	2 – 3 kW	2.5 – 4 sq mm
Air conditioner (1 – 1.5 ton)	~1.5 – 2.2 kW	2.5 – 4 sq mm
Air conditioner (2 ton)	~2.5 – 3 kW	4 sq mm
Kitchen (microwave, oven, hob)	3 – 5 kW	4 sq mm
Sub-main to distribution board	—	6 – 10 sq mm
Incoming mains (per load)	—	10 – 16 sq mm

For guidance only — size every circuit to its actual connected load, run length and an electrician's assessment per IS 732.

Tip: Choose a fire-safe grade for the wire itself, not just the right size. For homes, an HR-FR-LSH or HFFR wire (low smoke, halogen-free) is far safer in a fire than ordinary PVC.

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