CABLE CALCULATION: THE SCENARIO, A NEW COOKER CIRCUIT

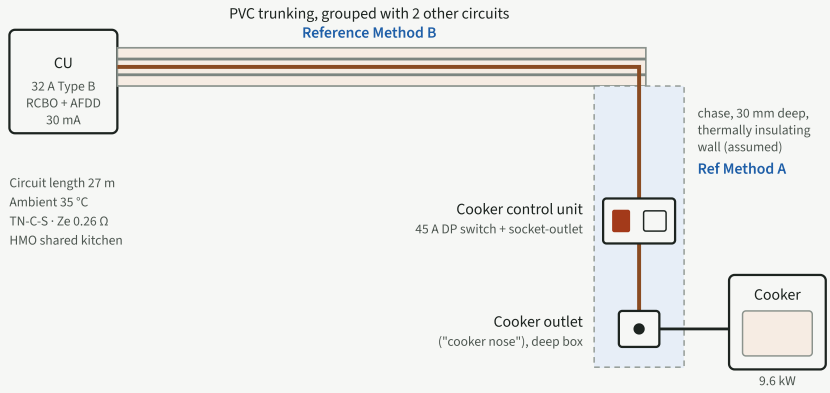
A 9.6 KW COOKER IN A SHARED KITCHEN. WHERE DO YOU START?

We work through one design scenario from start to finish. Page numbers are given as we go so you can follow in your own books. The books used are **BS 7671**, the **On-Site Guide**, **Guidance Note 3** and the **Electrician's Guide to the Building Regulations**. The idea is to pull together regulations that turn up in different modules and show how they all feed into one circuit.

THE DESIGN BRIEF

A circuit supplying a 9.6 kW cooker is to be installed. You are the designer. Design the circuit according to regulations and guidance.

- Existing installation has adequate earthing and bonding
- Earthing arrangement TN-C-S, measured Ze = 0.26 Ω
- Circuit length 27 m
- Run in PVC trunking with 2 other circuits, then vertically down the wall in a chase at a depth of 30 mm to the cooker control switch and the cooker outlet
- Ambient temperature 35 °C
- Client wants a socket-outlet on the cooker control switch
- Consumer unit: non-combustible dual RCD board, Type 2 SPD, spare ways on both the "protected" and "non-protected" side
- Cooker is in the shared kitchen of a house in multiple occupation (HMO)



Our scenario. The cable passes through **two** installation methods. You design to the **worst** one.

Make your own versions. These are the parts you can change to get a fresh question every time: the **load** (a 3 kW heater, a 10 kW shower…), the **Ze**, the

circuit length, the **grouping**, the **ambient temperature** and the **cable type**. Using the books for their real purpose is the best way to learn your way round them. They're industry books written by the IET, not textbooks.

> **Exam reality**
> A full design like this **won't** come up in your multiple-choice exams. That's Level 4 (design and verification) territory, where there are written questions this deep. But the **pieces** will come up: finding a correction factor for an ambient temperature, finding the mV/A/m for voltage drop, and so on. Being able to do the whole thing also makes you a much better electrician.

Talk to the client. You can't design well without knowing where things go (that sets the circuit length) and how the client will use the circuit. Sometimes you'll have to tell them a position isn't allowed because of a regulation.

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