CHAPTER 54: EARTHING ARRANGEMENTS AND THE MET

TN-S, TN-C-S, TT. WHICH CAN YOU INSTALL?

Chapter 54 covers earthing arrangements and protective conductors. If a question mentions **main protective bonding** or **supplementary bonding**, you're going to **544**. If it's about the earthing arrangement itself, you're earlier in the chapter.

THE EARTHING SYSTEMS — INCLUDING THE TWO YOU WON'T INSTALL

SYSTEM	NOTES
TT	The one that needs an **earth electrode**
TN-S	Separate earth throughout — the old lead-sheathed supply
TN-C-S	Combined then separated. **PME** is a version of TN-C-S
IT	High-impedance system. You are unlikely to meet one
TN-C	Terra Neutral Combined — earth and neutral combined all the way in and **never separated**. **Not permitted in UK consumer installations** (ESQCR Reg 8(4): no PEN conductor in a consumer's installation). You may meet it working abroad

> **Why TN-C is worth five seconds of your time.**
> The question "which combination of those letters haven't we used?" is exactly how an exam writer builds a distractor. Knowing TN-C exists, and that it's not allowed here, stops you second-guessing the three that are.

TABLE 54.1 — A BURIED EARTHING CONDUCTOR

This table gives the **minimum cross-sectional area of an earthing conductor that is buried in the ground**, and it splits on two questions: is it protected against **mechanical damage**, and is it protected against **corrosion** by a sheath?

CONDITION	MINIMUM CSA
Protected against mechanical damage **and** against corrosion by a sheath e.g. buried inside conduit or ducting	2.5 mm² copper · 10 mm² steel
Not protected against mechanical damage, but protected against corrosion by a sheath	16 mm² copper · 16 mm² coated steel
Not protected against corrosion — mechanical protection irrelevant	25 mm² copper · 50 mm² steel

Highlight the last row in Table 54.1 (p.208).
With no protection against corrosion, a buried earthing conductor must be at least **25 mm² copper** or **50 mm² steel**, whatever its mechanical protection.

542.4 — THE MAIN EARTHING TERMINAL

Part 1's fundamental principles said every installation must have an earthing arrangement. Part of that arrangement is a **main earthing terminal** (MET) or earth bar, and every installation must have one, because five different things have to land on it:

1. The **earthing conductor**
2. **Circuit protective conductors**
3. **Main protective bonding conductors**
4. **Functional earthing** conductors, where required
5. **Lightning protection system** bonding, where there is one

☰ The earthing terminal may be **external or internal**. You need **one or the other**, not both — as long as it lets you get the earthing conductor from the supplier's head through to your final circuits.

Chapter 54 · earthing arrangements and protective conductors

Table 54.1 · p.208 · minimum CSA of a buried earthing conductor ★

542.4 · main earthing terminal · what connects to it ★

544 · protective bonding conductors

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