203: Electrical installations technology  
**Handout 13: Wiring systems**

**Learning outcome**

The learner will:

1. know wiring systems of electrical installations.

**Assessment criteria**

The learner can:

3.2 identify **wiring systems** for different **environments.**

**Range**

**Wiring systems**: Cable tray, cable trunking, cable conduit, ladder racking, thermoplastic multi-core, flat profile, SWA, MICC, FP200, thermoplastic single-core, support methods and requirements, component parts.

**Environments**: Domestic, commercial, hazardous, industrial installation, agricultural.

**Wiring systems**

Electricians will be called on to install electric systems in a wide range of environments with the more common being:

* domestic installations
* commercial installation
* hazardous installations
* industrial installations
* agricultural installations.

These will all have their own unique hazards, both to anyone using the installation and also to the installation itself, from activities within those premises or the environment within those premises.

The wiring system chosen for a particular environment will depend on the level of protection required by the cabling and the type of support needed.

In any electrical system, the means of delivery of electrical energy to a load will vary. Different types of cable are used, as well as different ways in which these cables are supported and protected. The name attached to these are called wiring systems and they fall into general areas.

* **Clipped direct**: We can clip mineral insulated (MICC), steel wired armoured (SWA), cross-linked polyethylene (XLPE), polyvinyl chloride/polyvinyl chloride (PVC/PVC) cables directly to a surface, using appropriate clips. The setting defines the nature of the clips and how the cables are run.
* **Steel conduit and trunking**: Generally used to deliver single core cables in industrial, commercial and health settings. They are strong and able to resist high mechanical stresses.
* **Plastic conduit and trunking**: As with steel conduit and trunking, single core cables are generally installed in schools and commercial premises. It is less robust than steel conduit but easier to install.
* **Cable tray**: Cable tray is commonly used to support a number of cables where individual clipping is difficult or not economical. Tray is used either above ceilings or in industrial or commercial settings. It has a range of sizes from 50mm to 1,000mm.
* **Ladder rack**: This is similar to cable tray but with greater strength and is used in industrial settings to deliver large numbers of sub-main cables.
* **Basket tray**: Again, this is similar to cable tray but is more likely to be used in commercial premises for large amounts of smaller cables.