203: Electrical installations technology  
**Handout 19: Cable tray and ladder 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**

3.5 identify purpose of **specialised** equipment for installing **wiring systems.**

**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.

**Specialised**: Conduit and tray benders, stocks, dies, formers.

**Cable tray and ladder systems**

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| If it is required to run several sheathed cables, such as MIMC or SWA, along a common route then the time spent clipping and saddling the individual cables can be saved by the installation of cable tray.  Cable tray is usually installed in commercial and industrial installations.  Apart from carrying a large number of cables, cable tray can be used as a means of clearing obstructions such as pipework, etc.  It consists of a perforated metal channel which, once installed, can have cables fastened to it by means of cleats or cable ties. | | 01 Cables On Tray.png |
| **Standard duty cable tray**  Made from perforated sheet steel, the standard cable tray consists of a simple flat tray with a turned up edge.  It is available in widths varying from 50mm to 900mm and is most suitable for the installation of lightweight cables, such as MIMC cables or the smaller sizes of SWA.  **Heavy-duty cable tray**  Like the standard cable tray, this is manufactured from perforated sheet steel. However, this is of heavier gauge and the flanged edge is deeper.  Heavy-duty trays, despite the name, are suitable for medium-duty installation work. There is a full range of accessories for this type of tray and it comes in widths ranging from 150mm to 600mm. | standard cable tray.png | |

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| **Return flange cable tray**  There are a number of different patterns of this type of cable tray, varying from a simple returned flange to the heavy-duty types.  The returned flange gives the tray additional strength and therefore it can span greater distances without support, compared with the standard cable tray. | | return flange cable tray.png |
| **Types of tray finish:**   * hot dipped galvanised * unfinished sheet steel * red oxide undercoat * yellow chromate undercoat * epoxy resin coated * plastic coated.   **Typical sizes** available are 50mm to 900mm widths and it is generally supplied in 3m lengths.  **Tray accessories**  A range of accessories are available and some are shown in the picture on the right.  The working of cable tray, ie cutting, forming, etc, will be covered in Unit 204. | 04 tray and ladder accessories.png | |

**Cable tray specialist tools**

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| 06 cable tray bender.PNG | **Tray bending machine**  05 cable tray bender.PNG |

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| **Cable ladder**  This is used when a number of larger cables need to be carried along the same route (generally in larger industrial premises).  It is so named because it resembles a ladder, where the ‘rungs’ provide the fixing points for the cable.  Since the cables installed on ladder rack are generally larger ones, the gap between the rungs will not present a problem, as the cable will self‑support across the gaps.  Side wall heights available are generally between 50mm and 150mm, with various widths to suit a wide range of applications.  A range of accessories are available, including bends, reducers and tees, as shown below: | | 08 cable ladder.png |
| 08 cable ladder accessories.PNG | | |
| **Cable basket**  When running large numbers of small cables (eg data cable), cable basket can be used.  With this, the cables are simply laid into the basket and no cable fixing is required.  It is generally used in large commercial premises that have an extensive local area network (LAN) system to interconnect all computers and peripheral equipment. | 09 cable basket.PNG | |