

# GUIDANCE NOTE ON ELECTRICAL WIRING CABLES:

## MICC AND FP200 CABLES

### 1. Introduction

The DAC is sometimes asked to provide advice on the type of electrical wiring cables to use in churches. This brief guidance note describes two of the most common types of cables used in churches, MICC and FP200, and identifies their particular advantages and disadvantages and makes suggestions on which type of cable to use.

### 2. Basic Description of Cables

- 2.1 **MICC Cables** – have solid copper conductors surrounded by a compressed mineral insulation, usually magnesium oxide compound, all contained within a copper sheath. They are available in two voltage ratings: 500 volt grade (light duty) or 750 volt grade (heavy duty) for a wide variety of current ratings. They can be used with the copper sheath bare or with an additional halogen free low smoke and fume (LSF) covering. The LSF coverings are available in a variety of standard colours. Because the insulation is hygroscopic the cables have to be terminated in brass seal assemblies to prevent the ingress of moisture and the subsequent reduction of insulation resistance. This type of cable is manufactured by several companies, including Pyrotenax (which is now owned by the Tyco Thermal Controls Group), and has been in use for over fifty years.
- 2.2 **FP200 Cables** – are manufactured by Pirelli and are marketed as FP200 Gold. They have solid copper conductors in the smaller sizes and stranded copper conductors in the larger sizes. The conductors are separately insulated using a compound called Insudite and are all contained within a laminated aluminium tape screen with an overall thermoplastic low smoke and halogen free (LSOH) sheath. The sheaths are available in a small number of standard colours. The cables are terminated using simple nylon tapered glands, which grip the overall LSOH sheath. Other manufacturers market cables of a similar specification to FP200 Gold. FP200 Gold cables should not be confused with 'Firetuf' cables, which are flexible control cables with no mechanical protection.

### 3. Advantages and Disadvantages

- 3.1 **MICC Cables** – have many advantages including good physical strength, high fire withstand capability, comparatively small overall diameter for its current rating, protective conductor (i.e. copper sheath) has a low resistance, proven long life if installed correctly, unattractive to rodents and good resistance to corrosion when the cables are covered with LSF and the terminations are shrouded. The disadvantages include comparatively higher cost because of the greater value of the materials and terminations and the higher level of skill required to install the cables.

- 3.2 **FP200 Cables** – have one great advantage over MICC cables. They are cheaper to buy and install. They have similar characteristics to MICC but do not have the same level of fire resistance or durability. They also have a slightly larger diameter for the same current rating, are more difficult to bend tightly without corrugating and are available in a smaller number of sizes.

## **4. Conclusions and Recommendations**

- 4.1 Both MICC/LSF and FP200 Gold cables have many applications but churches need to be wired with cables, which: -

- Have a long life
- And are
  - Durable
  - Aesthetically acceptable
  - Economic to install

Although the life of all cables is small when compared to the life of the building, it is essential that the correct cable is chosen for the particular application. In some cases, where wiring systems can be completely concealed, without damaging the fabric of the building (e.g. within roof voids steel or high impact plastic conduit systems may be appropriate because of their ability to be re-wired easily in the future. Multi-core PVC insulated and PVC sheathed (PVC/PVC twin and earth) cables and 'Firetuf' cables should not be used as they do not have any mechanical protection and can be attractive to rodents.

- 4.2 Where cables have to be fixed to the surface, which is usual for most churches, MICC/LSF or FP200 Gold are the best cables to use. If funds are available, it is suggested that MICC/LSF cables are specified because of the advantages listed above. If short term funding is an over-riding factor then FP200 Gold can be used.