

FIRE RESISTANT CABLE FIXINGS

Terry Journeaux of Pirelli Cables outlines the new requirements of the code of practice for fire alarm systems BS5839-1:2002 in respect of cable fixings and gives details of a new fixing method.

Compared with BS5839-1:1988, the 2002 edition introduces some significant changes affecting cable selection and installation:-

- The use of fire resisting cables is now recommended for all manual call point and automatic fire detector circuits. The use of fire resisting cables is also recommended for all final mains power supply circuits
- Two different levels of resistance of cables to damage during the course of fire are recognized, and recommendations for application of each type are provided
- New test requirements for cables introduced
- Recommendations for networked systems, particularly in respect of cable types, are included
- New guidance on segregation
- Restrictions on use of multicore cable
- New guidance on cable fixings and accessories.



The new code of practice was published in October 2002 and became effective from July 2003 for new designs. This period was to allow for the necessary training in system design and installation practices and also to allow for the development and approval of new or modified products necessary to meet the new requirements. However, it is clear that although new products are appearing on the market, there is still much confusion in the market place as to the exact nature of the new requirements and how they can be satisfied.

The new testing requirements for fire resisting cables have received much attention but the new guidance on cable fixings should not be ignored.

Guidance on cable fixings and accessories

BS5839-1:2002 recognizes that methods of cable support should be such that circuit integrity will not be reduced below that afforded by the cable used, and should withstand a similar temperature and duration to that of the cable, whilst maintaining adequate support. In practice this means that fixings for “standard” cables should survive for 30 minutes at a nominal temperature of 850C without loss of integrity and those for “enhanced” cables for 120 minutes at a nominal temperature of 950C.

Plastic cable clips, ties or trunking are therefore noted as not suitable as the sole means of cable support.

The inclusion of trunking illustrates that although plastic trunking may be used for aesthetic or protection reasons, the cable (and trunking) must still be fixed to a suitable non-combustible substrate to meet the requirement of the code of practice.

Whilst these requirements for fixings are consistent with the advice to use proven metal fixings given for many years by major fire resistant cable manufacturers such as Pirelli, there were no specific requirements in earlier editions of BS5839.

Likewise terminals used to joint cables, except those within system components, should be constructed of materials that will withstand a similar temperature and duration to that of the cable. Manufacturers recommendations should be followed, but ceramic rather than plastic terminal blocks will most likely be necessary to fully meet the requirements. Fire resistant junction boxes are already available on the market to meet this requirement.

The need to address the fixings issue was born from problems reported from real fire situations. In one hotel fire investigated by the author, a fire alarm cable had been run from the main building to an annex across a courtyard tied to the bottom of an existing overhead steel cable tray with plastic cable ties. During an incident arising from a fire starting in the courtyard, it was noted that the fire alarm system in the annex had ceased to operate. Upon investigation, it was observed that although the cable tray was still intact, the fire alarm cable was no longer to be seen. It was found on the courtyard floor under various fire debris. The integrity of the whole fire alarm system had been compromised by the use of a few inappropriate fixings.

A new approach to cable fixing

Fire alarm installations carried out on metal trays would be acceptable under the 2002 code provided that the tray and tray fixings are confirmed by the manufacturer as sufficiently robust for the “standard” or “enhanced” fire conditions. Likewise the use of traditional copper P-clips or saddle clips would be acceptable. P-clips are generally used to support the cable when carrying out the required cable tests. However, Pirelli were aware that the market leading position of their FP range of cables for fire detection and alarm applications was largely based on ease and speed of installation and that installers were dissatisfied with the length of time (and therefore cost) taken to install using P-clips or saddles. The resulting development program has led to the launch of the FP FIREFIX™ cable installation system. Pirelli has developed FP FIREFIX™ in an exclusive partnership with ITW Construction Products, the construction industry’s leading tool manufacturer. Specially designed cable clips and adaptors allow FP FIREFIX™ to be used with ITW’s Spit Pulsa 700E cordless gas nailing tool, which is ideally suited to large volume installations. This system can fix each clip in just 10 seconds, about 10 times quicker than conventional clips.

The system was developed specifically to meet market demand for a fast, easy to use and cost effective method of installing cables in a market where the continuing shortage of qualified electricians and rising labour rates are major issues facing electrical contractors.

Pilot installations have been carried out to verify that FP FIREFIX™ dramatically improves productivity and leads to significant cost savings. The system has also undergone extensive testing in conjunction with Pirelli FP200Gold® and FP PLUS™ cables, which are independently approved against the “standard” and “enhanced” requirements, to prove that it is fully compliant with the new cable fixing requirements of BS5839-1:2002 for both “standard” and “enhanced” applications.



The FP FIREFIX™ clip holds one or two cables and may be pre-installed on the substrate, simply clipping shut after the cable(s) have been put in position. It can be fixed directly into a number of fire resistant substrates such as steel, composite steel decking, masonry, concrete and block work. The direct nail fixing and lack of any plug allays any fears that the plug may pull out under fire conditions. Compared with drilling, installation is less noisy, making the system ideal for refurbishment projects that have to be carried out in occupied buildings.

The Pulsa 700E tool has been assessed against HSE guidelines concerning hand arm vibration that confirm that an installer can install over 8000 clips per day without exceeding safety limits.

FP FIREFIX™ (Note the tool is sold separately)

Not only does the reduction in installation time mean that cost savings of up to 50% can be made but Pirelli are demonstrating their confidence in the FP FIREFIX™ system by offering a 10 year system warranty on installations using it in conjunction with FP200Gold® and FP PLUS™ cables.

FIG1: Typical example of savings using FP FIREFIX™- based on assumed installation rates

On to Brick	AP Clips	FP FIREFIX™
INSTALLER RATE m/hr	8	108
CLIPS PER METRE	3	3
TOTAL NO. OF CLIPS	24	324
COST PER km	£2,180.00	£1,408.15

Saving per km using FP FIREFIX™= 771.85

FIG2: Number of fixings that can be installed before exceeding HSE vibration level recommendations

