Fire Resistant Cables Between Buildings

Prysmian are often asked the question which fire performance cable should be used between buildings for fire alarm systems (to **BS5839-1**) or emergency lighting systems (to **BS5266-1**). This is a topic for which no specific guidelines are set out in either of the aforementioned standards. **BS5839-9** does however state that underground sections need not be fire resistant.

The principal cable standard that Prysmian manufacture for the Fire Alarm (BS5839-1) and Emergency Lighting (BS5266-1) standards is **BS7629-1**. We do not however, recommend the installation of cables manufactured to BS 7629-1 in buried ducts. We do not believe that it is possible to exclude water from the ducts (even if they are sealed) and these cable types are unsuitable for permanent or even semi-permanent wet conditions. They have aluminium foil screens which would be prone to corrosion in such conditions. Moreover, BS7629-1 cables are not armoured and therefore do not have intrinsic mechanical protection for buried installations.

BS5839-1 and BS5266-1 both allow for cables manufactured to **BS7846**, as an alternative cable standard, which are armoured cables. Traditionally in the UK all power cables that are buried are armoured. The cable must however, as a minimum meet the BS EN 50200 fire resistance test along with the Annex E water test (for **"standard"** cables).

Prysmian FP500 fulfils this design requirement, connecting fire systems between buildings. FP500 has been designed to satisfy CAT 3 Control cable requirements to BS 8519, including where control cable is used for single phase power applications. FP500 is a steel wire armoured (SWA) cable, which makes it ideal where mechanical protection is required, such as for buried or ducted routes between buildings*.

Alternatively, Prysmian FP400 armoured fire resistant cable is also suitable for burial or in ducts in free draining soils*. Prysmian can claim compliance with "**standard"** fire alarm circuits to BS 5839-1 (30 minutes) having undertaken in house testing on small size FP400 (2-4core 1.5-6mm²) cables.

* it should be noted that if the duct is already filled with water or the soil is not free draining, the long term integrity of these cables will be affected since the water will eventually permeate through the sheath and corrode the steel wire armour.

A point to note when using armoured cables is a long cable run may not be appropriate due to the data characteristics of such cables. A twisted paired cable may be more suitable.

We believe most inspection authorities would accept that any cable running (either direct buried or in an underground duct) would <u>not</u> be considered an area of particular fire risk, so it could be reasonably argued that fire resistant cables may not be needed for these sections.

We have summarised below the options for consideration to fulfil this requirement:

1) Run either FP500 cable, or small size FP400 between the buildings in the underground ducts and then joint to the BS7629-1 product within the building using a fire resistant joint and enclosure. It is not necessary for this to be positioned at the point of entry to the building.

2) Alternatively, run a non-fire resistant armoured cable (to BS5467/BS6724) in the underground duct between the buildings. At the point of entry to the building, the cable must be run directly into a fire resistant enclosure and joint to connect to the BS7629-1 cable, such as FP200 Gold/FT30. It is important to ensure the non-fire resistant armoured cable is not exposed within the building and pose a detrimental risk to the integrity of the fire alarm circuit.