



ASK EDDIE

SY CABLE PSYCHOLOGY



I've been asked to use SY cable in the final circuit to the inverter in a PV installation but I am wondering if these cables comply with BS 7671. My impression is that SY cables are being used increasingly in the UK as I have seen them employed in air conditioning systems and in factories. Are these types of cable acceptable for use in fixed electrical installations in the UK?



SY, YY and CY cables are flexible components widely used in the industrial sector, but they now feature increasingly in domestic installations.

This is due in part to them being more robust than standard flexible cables. In addition, no special tools are required which is an obvious advantage.

But a disadvantage is that cable data – such as the current-carrying capacity of conductors – is not readily available and reference must be made direct to the cable manufacturer.

They are described in some manufacturers' literature as control cables. The letters indicate:

- S - steel wire braid
- Y - PVC
- C - copper braid.

These letters do not indicate adherence to a particular standard. In the case of SY cables, they indicate only that these cables have a steel wire braid with a thermoplastic (PVC) oversheath.

SY, YY and CY cables are claimed by some cable manufacturers to comply with the German standard *VDE 0250*.

VDE 0250

The VDE Institute is a national and internationally accredited institution in the field of testing and certification of electrotechnical devices, components and systems.

VDE publish a series of standards covering among other things various cable types. But simply quoting the term *VDE 0250* is meaningless because it is not a specification and the *0250* is just one part of a complete standard number.

In order to be meaningful, the full standard number must be quoted. For example, the German NYM type of cable is defined in *VDE 0250-204:2000* but the full VDE standard to which these cables might conform is unclear.

VDE standards are German national standards. They are neither Harmonised European (EN) nor International (IEC) standards. So their use under *BS 7671* is not automatic and they would be subject to the required engineering assessment regarding safety.

NAPIT understands that the VDE Institute has issued certification to a small number of cable manufacturers for some SY, CY, and YY cables and that this is based on individual cable manufacturer specifications which are confidential to VDE and the manufacturer.

As these have not been published, we are unable to determine which material and construction specifications or tests have been applied. Consequently, authoritative literature is not available to help in making engineering judgements.

UK standards

The UK standard for PVC insulated and sheathed flexible cables is *BS EN 50525-2-11* and some manufacturers of SY, CY and YY cables claim conformity with this standard.

However, they have different constructions. There is no provision in *BS EN 50525-2-11* for any braid and hence a braided cable, such as SY cable, cannot conform to this standard.

BS EN 50525-2-11 specifies various types of PVC flexible cable such as *H05VV-F*.



Flexible cables in final fixes to equipment like floodlights are viewed as an obvious choice



Examples of SY (top), CY (middle) and YY (bottom) cables used in the electrical industry.
Images courtesy of Eland Cables

The Approved Cables Initiative (ACI) reported last year that cables designated SY, YY or CY often have lower insulation and sheath thicknesses by comparison with the BS EN flexible cables.

Foreign standards

Regulation 133.1.1 requires that every item of equipment (including cable) must comply with the appropriate British or Harmonised Standard. In the absence of such a standard, reference can be made to the appropriate IEC standard or the appropriate standard of another country.

As the VDE 2050 standard is neither a Harmonised European (EN) standard nor an IEC standard, it is doubtful that it could be referred to as appropriate.

If *Regulation 133.1.1* is not complied with, it requires the designer or the person responsible for specifying the cable to confirm that it provides at least the same degree of safety as that afforded by compliance with the regulations.

A similar requirement for the designer or specifier to confirm the safety of non-standard equipment is given in *Regulation Group 511*.

This leads to two key questions: if you have specified the use of SY, CY or YY cables can you give such an assurance? And on what basis would it be given?

Fixed installations

The fact that the SY, CY and YY variations are flexible cables, it brings up a general point on the use of these components in fixed installations.

An obvious use for flexible cables in fixed installations is for the final connection to equipment that may need to be adjusted – such as floodlights or motors. Flexible cables may also be used for overhead wiring between buildings.

Regulation 521.9.1 permits the use of flexible cables for fixed wiring if they are heavy duty, the risk of damage is low or protection against mechanical damage is provided.

But NAPIT does not advise the use of flexible cables in fixed electrical installations generally.

Several manufacturers' data sheets state that SY cables are not suitable for fixed wiring applications, requiring compliance with the regulations set out in *BS 7671*.

Conclusion

There is no doubt that SY, CY and YY cables have their supporters within the industry, but the fact remains that they are non-standard and the general industry guidance is to discourage their use.

To be certain that cables comply with *BS 7671*, only those that are recognised in *BS 7671* should be selected.

Cable manufacturers may claim that their cables comply generally with a British or Harmonised Standard. All such claims should be treated with scepticism unless they can be verified.

When buying it is important to ensure that the cable has the manufacturer's name and the standard or reference number clearly indicated on the sheath.

It is advisable to look for a third party mark of approval such as BASEC or LPCB. In Issue 1 of *The Competent Person Magazine 2017* Dr Jeremy Hodge, chief executive of BASEC, gives helpful advice on buying cables.

Do you have a question?

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