

Use of SY, CY and YY Cables in UK-based Fixed Installation. Overview

Under BS7671 18th Edition Wiring Regulation, SY, CY and YY cables are only appropriate for UK fixed wiring installations requiring compliance with the Wiring Regulations where certain standards can be determined, provisions made, and such use is recorded in the appropriate electrical certification.

Clause 133.1.3 of the Wiring Regulations requires that when a cable that is neither a British, harmonised or other national standard is used, the specifier / designer ensure an equivalent degree of safety is achieved as when using a British standard cable.

SY, CY and YY cables are not manufactured to a specific British, European or international standard so in most cases it is not possible to demonstrate the performance safety standards required to satisfy the Wiring Regulations.

Veriflex SY, CY and YY cables are BSI Kitemark tested in a UK-based ISO17025 UKAS accredited laboratory. Every batch of cables, in every core and size configuration has their component construction layers tested against relevant British and European standards to determine compliance. By holding the BSI Cable Test Verification Kitemark the performance safety standards of the cable can be accurately identified and appropriate adjustments to the installation environment (to match an equivalent British standard cable) can be made as required.

This BSI Kitemark is unique to Eland Cables and the Veriflex range of SY, CY and YY cables are the only cables of their type on the market to hold this accreditation.

For a full explanation, please read our attached statement as supported by RINA (formerly Edif ERA)



Use of SY, CY and YY cables – RINA Report 2018 – 0449 Issue 2

Eland Cables has recognised that the cable types known as SY, CY and YY are being used in applications that may not be appropriate for these cable types. Eland has prepared a statement giving their views on the use of SY, CY and YY cables in electrical installations complying with BS 7671.

RINA has reviewed that statement prepared by Eland Cables and supports the views that they express. The statement that was reviewed is appended to this report.

It is RINA’s view that these cable types are intended for use as a control cable and are not designed for use in power circuits. Also these cable types are not designed and manufactured to a specific standard.

The aspects of the use of these cables in an installation, that is intended to comply with BS 7671, that RINA considers are of particular concern are given below.

- Regulation 133.1.3 of BS 7671 permits the use of equipment not covered by standards provided that it is confirmed that it provides the same degree of safety as equipment complying with an appropriate standard. It is RINA’s opinion that this would require a technical justification, for the use of such equipment, that is acceptable to the specifier, end user and those signing off the electrical installation certificate.
- BS 7671 requires measures to be taken to provide protection against electric shock. This is commonly achieved by equipotential bonding and automatic disconnection of the supply. To achieve acceptable disconnection in the event of an earth fault the fault loop impedance must not exceed maximum specified values. The SY and CY cables have a metal braid screen. The resistance of the screen is not specified. If, in longer runs, the cable is damaged such that the screen makes contact with a line conductor, producing an earth fault, the fault current may not be sufficient to operate the protective device in the required time. This could leave the screen and the equipment it is connected to at an elevated voltage, depending on the cable length and the location of the fault.

It is acceptable to RINA for Eland Cables to add the following statement to their statement concerning the use of SY, CY and YY cables “RINA (formally ERA Technology) has reviewed this statement and support the views expressed by Eland Cables”.

Report compiled by:

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RINA Consulting (formerly ERA Technology)

RINA is a global testing and certification body established in 1861 with 170 offices in 65 countries, working across Industry, Infrastructure & Transport, Energy and Marine. It has issued more than 36,000 product certificates, 28,000 management systems certificates and performing in excess of 150,000 laboratory tests. www.rina.org.en

Statement on the use of SY, CY and YY cables in the UK

SY, CY and YY cables are flexible control cables, designed for measurement and control in equipment such as assembly and production lines. They have finely stranded, flexible Class 5 copper conductors, and the SY and CY variants have a steel or copper braid layer. These cables are widely used in the UK and Europe yet are not manufactured to a designated standard – anyone claiming conformance to BS EN 50525-2-11 is doing so incorrectly as the insulation thickness doesn't meet the minimum requirements and this standard does not include allowance for a steel or copper braid.

Confusion has arisen in the market around the applications these control cables can be used for. It has been suggested that these cables are not 'fit-for-purpose' without defining the 'purpose'. For the avoidance of doubt, SY, CY & YY cables are compliant when used appropriately in UK applications for control functions under BS EN 60204.

Where debate does exist is in relation to the use of these cables as fixed installation power cables. Under BS 7671, (18th Edition) Wiring Regulations, these cables are not considered suitable as a direct substitute for a British Standard fixed wiring cable with their more rigid Class 2 stranded conductors.

The Wiring Regulations are the rules for "design and erection of electrical installations so as to provide for safety ...". Nevertheless, it does allow for an installation designer to choose to use these cables in a compliant manner, where the installation environment has been adapted and the designer can demonstrate that the same level of safety as an equivalent British Standard cable has been achieved.

This is defined in the following sections of BS7671 18th Edition Wiring Regulations:

- 133.1.1 Every item of equipment shall comply with the appropriate British or Harmonised Standards. In the absence of such a standard, reference shall be made to the appropriate International (IEC) standard or the appropriate standard of another country.
- 133.1.2 Where there are no applicable standards, the item of equipment concerned shall be selected by special agreement between the person specifying the installation and the installer.
- 133.1.3 Where equipment to be used is not in accordance with Regulation 133.1.1 or is used out the scope of its standard, the designer or other person responsible for specifying the installation shall confirm that the equipment provides at least the same degree of safety as that afforded by compliance with the Regulations. Such use shall be recorded on the appropriate electrical certification specified in Part 6.

For clarity, the braid screen on SY and CY cables should not be considered as 'armour', particularly with regard to Regulations 522.6.201 to 522.6.204 and Regulation 522.8.10. This is because the impedance and fault current capacity is not well defined.

Notwithstanding the above, it should be made clear that Eland Cables is not advocating the use of control cables in fixed installations in the UK, and we indeed believe that the design adjustments required for installation compliance would not normally be cost-effective (eg: using SY cable instead of BS 5467 SWA

by installing into metal cable ducting to provide the same level of mechanical protection). In general, for UK fixed wiring installations, it may be simpler to use cables complying with British or IEC standards as particular justification for their use is not required.

In any event, it would be the sole decision of the installation designer or responsible person to specify the use of any chosen cable.

Eland Cables can demonstrate that the Veriflex SY, CY, and YY cables meet the following **British and European performance test standards:**

- Vertical Flame Testing to BS EN 60331-1-2
- Conductor Resistance Testing to BS EN 60228
- Tensile and Elongation Testing to BS EN 60811-501
- Insulation Resistance Testing to BS EN 50395 RoHS
- Compliance Testing to BS EN 62321-3-1:2014

It is these tests, performed in an ISO 17025 UKAS accredited laboratory, which attest to the quality (and therefore safety) of our cables. This is demonstrated by certification to the BSI Cable Batch Verification Kitemark™.

Through the BSI Cable Batch Verification Kitemark, Eland Cables can demonstrate that the Veriflex SY, CY and YY cables are:

1. Tested against and are compliant with relevant British and European standards listed above
2. Fit-for-purpose where that purpose is appropriate system control applications and moving equipment.



For more information or clarification on the use of our control cables in your application, please contact our technical hotline on technical@elandcables.com or by phone on 020 7241 8500.

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