

Product Guide – BS 8436 LSX

CABLE CONSTRUCTION



Conductor: Plain annealed copper stranded (Class 2) conductor BS EN 60228

Insulation: Type GP8 to BS 7655-1.3, 70°C cross-linked insulation

Screen: Aluminium foil tape

Sheath: Type LTS3 to BS 7655-6.1, LSOH sheathing compound

AIM

The purpose of this guide is to inform users about characteristics and limitations of electric cables and thereby ensure correct use. These cables are intended for the transmission and distribution of electricity or earthing purposes. BS 8436 assumes that the design of installations and the specification, purchase and installation of cables specified is entrusted to people who meet the definition of a skilled person or instructed person, as given in BS 7671.

The appropriate levels of safety should be observed when handling cables and reference should be made to such documents as Health & Safety at Work Act 1974 and any relevant local Risk Assessments.

GENERAL

This guide should be read in conjunction with the latest issue of the product datasheet.

These cables are designed and manufactured to BS 8436 and incorporate a metallic screen layer. Manufactured with low smoke and low corrosive acid gas properties to reduce the amount of black smoke and acid gas emission during a fire.

These cables meet the nail penetration as defined in BS 8436, which allows their use to comply with **Clause 522.6.204(i) in BS 7671**. This is often referred to as suitable for thin partition walls. For such applications, it is imperative that to achieve a satisfactory safety performance, the selection of protective device and the maximum current rating is adhered to, as defined in the

commentary in **Table H.1** in BS 8436. Only **Type B circuit breaker** conforming to BS EN 60898 or a **Type B RCBO** conforming to BS EN 61009-1 can be used in these situations.

These cables are intended for installation in free air, clipped direct to a surface or cable tray/basket. These cables are not suitable for installations in the ground. Where cables need to pass between buildings (via underground duct), reference should be made to the Prysmian UK guide which can be found in the **technical area** on our website.

COMPLIANCE

Electrical Safety

Prysmian UK products fully comply with the electrical safety requirements of both the UK and the EU. (often referred to as Low Voltage Directive - LVD)

- Electrical Equipment (Safety) Regulations
- Directive 2014/35/EU

Construction Products Regulation – CPR

The Construction Products Regulation is a legal requirement of the UK and European markets. Cable products are subject to Reaction to Fire performance requirements where they are intended for use in construction works (Fixed Installation), including both buildings and civil engineering works.

Cables manufactured to this standard are predominately used in construction works so must meet the requirements for CPR. A Declaration of Performance (DoP) certificate can be obtained from <https://uk.prysmian.com/technical-area>

REACH/ROHS/WEEE

The *Registration, Evaluation, Authorisation & restriction of Chemicals (REACH) Regulations* in the EU and the UK operate independently from each other. Companies that supply and purchase substances, mixtures or articles to and from the EU/EEA/Northern Ireland and Great Britain (England, Scotland and Wales) need to ensure that the relevant duties are met under both pieces of legislation. Under the Northern Ireland Protocol the EU REACH Regulation continues to apply to Northern Ireland, while UK REACH regulates the access of substances to the GB market. Prysmian UK uses substances (as raw materials) in articles (not intentionally releasing substances) and mixtures and, it has undertaken all necessary steps to comply with both regulations.

Under *The Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment (EEE) Regulations*, any manufacturer, importer or distributor of electrical and electronic equipment (EEE) for the Great Britain market has the responsibility for ensuring that levels of certain hazardous substances and chemicals are not exceeded. Prysmian UK undertakes all necessary steps to ensure compliance to the ROHS regulations.

The Waste Electrical and Electronic Equipment Regulations (WEEE) are aimed at reducing the amount of waste electrical and electronic equipment (WEEE) incinerated or sent to landfill sites. Reduction is achieved through various measures which encourage the recovery, reuse and recycling of products and components.

Statements of Compliance to the above regulations can be obtained from <https://uk.prysmian.com/technical-area>

ENVIRONMENT AND APPLICATION

These cables are intended for locations where a low level of emission of smoke and corrosive gases are required in case of a fire or burning. This fully screened design provides EMC protection for signal clarity.

These cables are intended where applications require compliance with **Clause 522.6.204(i) in BS 7671**. These can also be used for installation in walls, on boards, on tray, basket, in conduit, trunking or embedded in plaster for small power and lighting applications within buildings used for residential, commercial, or industrial purposes.

Low smoke flat wiring cables are **not** suitable for:

- The provision of circuit integrity in case of a fire
- Applications where the cable is to be installed in contact with water
- Direct or indirectly buried in the ground
- Connections to mobile equipment
- As self-supporting aerial cables

These cables do not provide protection against damage by rodents, termites etc. These cables can be harmed by exposure to corrosive products or solvent substances, especially petroleum-based chemicals, or their vapours.

When using this cable in the presence of explosive or flammable atmospheres, reference should be made to **BS EN 60079**.

VOLTAGE

In an alternating current system, the rated voltage of the cable shall be at least equal to the nominal voltage of the system for which it is intended.

These cables are intended for use within a nominal power frequency range of 49 Hz to 61 Hz.

The operating voltage of the system may permanently exceed the nominal voltage of the system. The maximum permanent permitted operating voltage of the cable is stated in the table below.

Rated voltage of cable	Maximum permanent permitted operating voltage of the system			
	a.c.		d.c.	
U_0/U	Conductor-earth	Conductor-conductor	Conductor-earth	Conductor-conductor
V	U_0 max (V)	U max (V)	V	V
300/500	320	550	410	820

CABLE SELECTION

Cable selection is the responsibility of the system designer, Prysmian UK offer the following to assist with this process.

The method of installation used for the cable affects its current-carrying capacity, and due account should be taken for this. If the cables are to be exposed to localized heat or higher ambient conditions, the current carrying capacity will be reduced and may therefore impact on the size of cable required.

Where the cable is being used to comply with **Clause 522.6.204(i) in BS 7671**, a Type B circuit breaker conforming to BS EN 60898 or a Type B RCBO conforming to BS EN 61009-1 must be used in such circumstances. Additionally, the maximum current ratings of the cable and maximum let through energy of the protective device shall be restricted to the following limitations.

Size (mm²)	Maximum Current Rating (Amps)	Maximum Let Through Energy (I²t) for Type B Protective Device (A²s)
1.0	16	42,000
1.5	20	42,000
2.5	32 (when used in a ring circuit)	60,000
4	32	60,000

Where this product does not need to comply with **Clause 522.6.204(i) in BS 7671**, then appropriate current ratings for this product can be found in **Table 4D2A of BS 7671**.

Cable size selection is influenced by both the voltage drop of the circuit as well as the limiting current rating of the cable for the given installation conditions. The circuit length, along with the current rating will influence the voltage drop and may be the determining factor in the cable size selection. Short circuit requirements may also be a determining factor in cable size selection.

Volt drop factors for this product can be obtained from **Table 4D2B**. Prysmian UK have historically used a maximum of 2-2.5% volt drop.

Tables for correction factors can be found in **Appendix 4 of BS 7671**.

Prysmian have developed a cable app which can assist with sizing these cables, please visit <https://uk.prysmian.com/cable-calculator> for more information or search ‘**CableApp**’ in the App Store or Google Play. The tool also provides an energy efficient proposal for consideration.

CABLE INSTALLATION

Operating temp:	-25 °C to +70°C (the cable should not be installed when either the ambient or cable temperature is below -15 °C)
Max. short circuit temp:	Maximum conductor temperature should not exceed 160 °C*. Maximum allowable time is 5 s.
Max. overload temp:	Maximum conductor temperature should not exceed 115 °C*. Maximum allowable time is 4 h. Reference should also be made to Clause 4 of Appendix 4, in BS 7671
Min. bending radius:	6 x overall diameter of cable. Refer to the product datasheet for cable diameters Note: Wherever possible, larger installation radii should be used.
Cable Pulling Tension	Maximum pulling tension is 5 kg/mm² of total conductor cross sectional area up to a maximum of 100 kg.

Exceeding the recommended pulling tensions can result in damage to the cable.

*Repeated short circuits and overloads can potentially damage the cable and lead to premature failure.
Note: More installation guidance on these cables can be found on our website <https://uk.prysmian.com/technical-area>

BS 8436 cables should be installed in accordance with the appropriate regulations, including the latest edition of the Wiring Regulations (BS 7671), making sure it is suitable for the intended operating conditions and equipment classification, and taking into consideration any external influences which may exist such as ambient temperature, presence of water and fauna.

Precautions should be taken to avoid damage to the insulation during the installation and termination of these cables and should be prevented from being in contact with or close to hot surfaces.

This cable shall be located and installed such that their intended heat dissipation is not inhibited, and to ensure they do not present a fire hazard to adjacent materials.

Cables shall not be operated at temperatures higher than those recommended within this guide. Operation at higher temperatures can cause serious damage resulting in premature failure or a significant reduction of the properties of the cables.

Where the surface of the cable is liable to exceed 50°C, the cable shall be so located or guarded as to prevent contact of persons or animals. Reference should be made to **Table 42.1 in BS 7671**. Additional protection should be used in installations where the cable may be subject to damage by fauna.

Except for where additional mechanical protection is provided, provision shall be made to ensure the cable is placed out of reach. Reference should be made to **Clause 417 in BS 7671**.

Any gland and associated shrouds, if used, shall be of the halogen free, low smoke specification.

CABLE FIXING AND SUPPORT

Cables are intended for use in fixed wiring applications which should be supported adequately and shall not be damaged by any mechanical restraint used for their support.

Where cables are installed vertically, without intermediate support, and are inaccessible and unlikely to be moved or disturbed, they shall be supported at the top of the run such that the internal radius of the resultant bend is not less than the appropriate minimum bending radius. The unsupported vertical length should not exceed 5m.

Clause 521.10.202 in BS 7671 advises that wiring systems shall be supported such that they will not be liable to premature collapse in the event of a fire.

Account shall be taken of the possibility of damage to cables and their supports due to the disruptive effects of the electromechanical forces caused by any current which the cables may have to carry in service, including short circuit ratings.

Cables which have been in use in fixed installations can be damaged if they are disturbed.

The likelihood of vibration and the mass of the cable between the supports shall be considered when deciding the actual spacing required. The recommended maximum spacing of supports are given in the table below.

Table of Cable Support Distances		
Overall cable diameter (D) (mm)	Recommended spacing	
	Horizontal (mm)	Vertical (mm)
$D \leq 9$	250	400
$9 < D \leq 15$	300	400
$15 < D \leq 20$	350	450
$20 < D \leq 40$	400	550
$D \leq 9$	250	400
Note: Runs at an angle of more than 30° from vertical – use horizontal. Runs at angle 30° or less – use vertical.		
*For cables in enclosed systems please refer On-site Guide e.g. trunking etc.		

STORAGE AND HANDLING OF CABLE

Cables shall be stored in dry locations indoors and shall not exceed the recommended storage temperature of 40°C, or be lower than the recommended minimum installation and handling temperature of 0°C. If the cable falls below the minimum installation temperature or if it exceeds the maximum storage temperature then additional precautions shall be taken as the likelihood of damage to the cable is increased.

Care shall be taken during handling or transportation to minimise any mechanical stress. Suitable precautions shall be taken to assure safe handling of the packaged cable so as not to damage the cable or cause danger to others.

Note: A detailed guide to the safe handling of cable drums is given in **BS 8512**. Prysmian UK have a general guide covering this. For more information, please refer to the following website, <https://uk.prysmian.com/technical-area/guides>.

END OF LIFE/WASTE AND SCRAP CABLE

Product – Information and guidance on the incineration of scrap cable should be obtained from the Environment Agency.

Packaging – Where possible, packaging should be recycled. Please check with Local Authorities.

Drums – Prysmian UK offer a drum collection service. Please check drum label for details.

CABLE DESIGN LIFE

Prysmian UK cables will meet or exceed their design life of 25 years when correctly selected and installed in accordance with appropriate regulations. This design life has been assessed on a continuous maximum loading, which is the cable running at the maximum conductor temperature (90°C) for 24 hours a day and 365 days a year.

It is not recommended that the cables are relocated from their original installation location. This is because cables will tend to set in position over time and moving them can damage the cable.

Further information concerning this area can be found in our guide to design life. Please refer to <https://uk.prysmian.com/technical-area/guides>.

CONTACT INFORMATION

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