



A Simple Guide to **BASEC**

The British Approvals Service for Cables





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Introduction

This guide sets out to give you information on BASEC and on the cable products we approve. In this guide you will find details about who we are, how we operate, the product areas we work in, and the reasons why people across the world use BASEC approved cable.

BASEC is a recognised leader in product certification services for electrical cables, data / signal cables and ancillary products.

Our name is known for its professional stamp of quality in the field of cable certification and we ensure that our scope of activities is continually developed.

We are a service, and we are at your service, so please don't hesitate to contact us if you have any questions about cables, cable approvals or cable applications, whether you are a cable manufacturer, trader, specifier or a cable user.

Please see the contact details on the reverse of this document.



BASEC is a specialist certification body with expertise in cables and related products. Our Board and Certification Committee provides independent governance. We are Government-nominated and are accredited by UKAS. From our base in Milton Keynes in the UK, we work closely with many industry organisations including the British Standards Institution and the British Cables Association.

BASEC ensures that cable products meet appropriate national, European and international standards by detailed examination of manufacturers' production processes and regular, rigorous testing of their products.

Through our teams of highly skilled engineers and auditors who possess extensive in-depth industrial and commercial experience, BASEC has a reputation for professional and thorough assessment processes which ultimately lead to the issuing of our highly respected certification.

We provide cablemakers and related organisations with assessment and certification for quality management (ISO 9001), environmental management (ISO 14001) and health & safety (OHSAS 18001) management systems.

BASEC also offers Process Capability assessment in cable making, certification of innovative and variant cable products (Certificates of Assessed Design), and provides independent investigation, testing and advice in connection with the manufacture or use of cables, or in the event of disputes.

Formed in 1971 by cable manufacturers, electrical contractors and standards setters, the organisation has grown to be a modern, accessible body servicing and representing its many client manufacturers.

Who we are...

and what we do



BASEC is active worldwide, with our approved products being specified and used in many territories. Here, we advise and guide local organisations, taking into consideration regional legislation and conditions to ensure their products and services reach recognised standards.

With the globalisation of the market in cables, we now provide certification services to manufacturers in many parts of the world. Wherever you are, you will receive the same level of care and attention to your business from our team of assessors.



Certification and the benefits for industry

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Product Certification and BASEC Marking

BASEC's main product approval service is Product Certification and BASEC Marking. This is a two step process and applies to individual cable types. Approval can be awarded to national, regional, international and other standards.

Manufacturers may apply for a licence to display the BASEC mark on their products only when BASEC is satisfied that their manufacturing systems are capable of consistently producing cable products, through assessment to the BASEC Product Certification Requirements. BASEC also verifies that the products fully comply with the relevant specification by full type testing at independent laboratories or by witnessing tests at the factory.

Manufacturers holding a BASEC Product Marking Licence are subjected to regular factory audits and product surveillance testing to verify ongoing conformity.

Certificate of Assessed Design

BASEC offers a Certificate of Assessed Design in respect of new concepts for which no national or international standard exists, or for variants from an existing standard. A manufacturer's or user's specification may be used as the basis, which BASEC will review against current industry standards, safety and regulatory requirements. BASEC marking of the product is possible in many cases.

Process Capability Approval

BASEC offers an enhanced assessment and certification process that verifies the overall capability of a manufacturer's processes. This includes the witnessing of a significant number of cable tests by BASEC, and hence permits the manufacturer to BASEC mark a wider range of products.

HAR Scheme Approval

BASEC is a member of the European HAR group, which offers mutually recognised product certification for European harmonised cable types, to

manufacturers based in HAR Scheme territories. This permits additional <HAR> marking.

Management System Certification

BASEC offers management system certification to cable manufacturers and other organisations involved with the cable sector. Assessment may be to an individual standard or to two or more in an integrated manner, such as:

- Quality management systems to ISO 9001
- Environmental management systems to ISO 14001
- Health & Safety management systems to OHSAS 18001

The BASEC approach is tailored to cable making and is designed to assess an organisation's ability to produce goods and services consistently to specification and customer requirements, in a safe manner and with due regard to the environment.

Note: holding any of these types of certification alone does not constitute BASEC approval for any product, or permit the marking of cable with the BASEC certification mark.

Investigation, Testing and Advice

When a concern, problem or dispute arises in relation to the use of cables, for example in the case of failure or performance problems, BASEC can conduct an independent investigation into performance or compliance to specification. This may include testing and the assessment of specifications. BASEC will advise on the causes of the problem and provide assistance with the selection of specifications.

Notified Body Services

As an official Notified Body under the European Low Voltage Directive, BASEC can perform assessments and prepare technical reports for manufacturers and importers of cable products.

There is sometimes confusion between approvals of cables and the standards which sets the specification for cable types, cable tests, performance requirements and material specifications. Around the world there are many different such standards and BASEC is often asked for advice when comparing them. Guidance on low voltage cable selection is available in BS 7540.

A key part of our role is to make sure that the claims of compliance made by manufacturers about their cable are valid. Cable standards refer to many subsidiary standards. BASEC applies all levels of standard to check that the design, electrical and mechanical properties, material properties and specialist performance criteria such as fire performance meet the required levels.

BASEC works closely with standards bodies such as the British Standards Institution (BSI) to ensure that standards and specifications are up to date and relevant to user needs. Here is a list of some of the common types of cable that BASEC approves to, and their relevant standards.

Installation cables (building wire)

BS 6004

This is the main standard for PVC wire and cable commonly used in final circuits in buildings. There are 11 Tables, each describing a particular construction type, including the familiar "flat twin and earth", "meter tails", "conduit wire" and other types.

BS 7211

This standard offers Low Smoke Halogen Free (LSHF) versions of many of the types of wire and cable found in BS 6004. There are nine Tables.

Power distribution cables (low voltage)

BS 5467

Armoured power cables with XLPE or EPR insulation and PVC sheathing, used in many construction, commercial and industrial applications.

BS 6724

Armoured power cables with XLPE or EPR insulation and LSHF sheathing, commonly used where public access is a factor.

BS 7846

Fire resisting armoured power cables with XLPE or EPR insulation, LSHF sheathing, and enhanced circuit integrity properties.

BS 6346

Armoured power cables with PVC insulation and PVC sheathing.

BS 7889

Non-armoured power cables with XLPE or EPR insulation and PVC sheathing.

IEC 60502-1

Armoured and non-armoured low voltage power cables with a variety of types of construction and materials.

Control and instrumentation cables

BS 6231

This is the primary British standard for single core instrument wire and includes the higher temperature rated type known commercially as "tri-rated." This means it can simultaneously comply with British, American (UL) and Canadian (CSA) standards.

BS 5308

This British standard for control and instrumentation cables offers a wide range of construction options, which can suit many industrial requirements including oil and petrochemical.

Flexible cables

BS 6007

This standard covers rubber and silicone elastomeric heat resisting cables used for internal wiring.

BS 6500

The main British Standard for flexible cables, it incorporates numerous construction types, many of which are harmonised with European standards and are within the HAR scheme.

BS 7919

These flexible cables are intended for industrial applications and many are within the HAR scheme.

EN 50525 and HD 21 / HD 22

Harmonised European standards for flexible cables (and other cables including single core conduit wiring) are set out in the forthcoming EN 50525 series of standards, and include many types formerly listed in the Harmonisation Documents HD 21 and HD 22. BASEC can approve all of these cable types, many within the HAR scheme.

Medium and high voltage cables

BS 6622

Armoured medium voltage cables with XLPE / EPR insulation and PVC sheathing, for rated voltages from 6.6 kV up to 33 kV.

BS 7835

Armoured medium voltage cables with XLPE / EPR insulation and LSHF sheathing for rated voltages from 6.6 kV up to 33 kV.

IEC 60502-2

Armoured and non-armoured medium voltage power cables with a variety of types of construction and materials, for rated voltages from 6 kV up to 30 kV.

BS 7870 (many parts)

Low voltage and medium voltage cables used by electricity generation and distribution utilities.

Data and telecom cables

BASEC offers approval to a range of data and telecom standards, including IEC 11801, BS EN 50173 and TIA/EIA 568.

Cable accessories

BASEC can provide testing and approval for a wide range of cable accessories such as lugs, glands and joints.

Fire performance cables

Most cable standards include a basic requirement for single cable flame propagation testing. Some cables are made using polymer compounds which are low smoke halogen-free (LSHF). Other cable types are specifically designed to have a high level of performance during a fire and have fire survivability (circuit integrity) characteristics.

Cable Standards, Testing and BASEC Approval

Many standards and codes of practice for safety-critical systems set requirements for fire performance cables, including BS 5839 (02) for fire detection and alarm systems and BS 5266 for emergency lighting.

Cables are tested for their fire properties against a number of test standards, as specified in the relevant cable or performance standard. BASEC approves fire performance cables to the following cable standards:

BS 7629-1

Widely used British Standard type of "soft skin" fire resistant screened cables having low emission of smoke and corrosive gases when affected by fire, commonly used with fire alarms and emergency lighting.

BS EN 60702-1 (IEC 60702-1)

Internationally harmonised standard for mineral insulated cables. These have high fire resistance / performance and fire survivability properties, and are commonly used in emergency systems.

BS 7846

Fire resisting armoured power cables with XLPE or EPR insulation, LSHF sheathing, and enhanced circuit integrity properties. Widely used cable in industrial and commercial environments where a rugged fire survival cable is needed.

BS 5839-1

Alarm system design standard which sets two performance grades for cabling – "Standard" (PH30) and "Enhanced" (PH120). Cables made to BS 7629-1, BS EN 60702-1 and BS 7846 may be tested and awarded this additional grading.



Fire test standards for cables

BS 6387 sets performance requirements for cables required to maintain circuit integrity under fire conditions. This long-established performance and test standard offers several grades for fire, water and mechanical shock attack, with the highest performing cables rated "CWZ" for the three separate elements of the test.

BS 8491 is a challenging fire test intended for fire survival cables for smoke venting and related systems that need to operate for extended periods in a fire (previously in BS 7346-6). Has direct impact on the cable and application of a water jet.

BS EN 50266 and IEC 60332-3 describe common test methods for vertically-mounted bunched cables under fire conditions, using a 3m vertical "ladder rack." Procedures for various classes of test are set out in subsidiary parts of the standards. The future EN 50399 test for European regulatory purposes will add smoke and heat release measurement.

BS EN 50200 defines methods of test for resistance to fire of unprotected small cables (20mm max) for use in emergency circuits. A U-shaped section of cable is subjected to a gas flame, mechanical shock and optional water spray. BS 8434-2 modifies BS EN 50200 with a 930°C flame and with water spray.

BS EN 61034 (IEC 61034) defines a measurement of the smoke density from cables burning under defined conditions. This test uses a 3m cube in which cable samples are burned to produce smoke, the optical density of which is measured.

BS EN 50267 series (IEC 60754) set out common test methods on gases evolved during the combustion of materials from cables. They use a tube furnace to measure halogen content and pH of gases - a measure of acidity - and together with the smoke cube test define the requirements for LSHF status.





Cables, Quality and Safety

We test and re-test products to ensure they meet the relevant standard for that particular use, whether for fire performance, industrial, construction, OEM, domestic or whatever application it is intended.

By not compromising on quality cables tested and approved by BASEC, users can be assured that the cable is fit for its intended purpose, is safe to use and has long term reliability.

All BASEC approvals follow the same approach. Each approved product is subject to a high level of product testing, manufacturing assessment and ongoing surveillance, in accordance with BASEC's scheme rules and regulations.

Only once it has passed this rigorous process can we then issue the BASEC certificate which allows the manufacturer to use the BASEC mark on its product.

In support of its founding objectives to enhance the quality and safety of cable and related products in the marketplace, BASEC also undertakes market surveillance testing on cables on sale that do not carry BASEC approval. When serious problems are found with compliance, BASEC provides a warning and advice to the traders and if necessary notifies the relevant authorities.

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