The importance of fire testing and CPR for cables to safeguard your projects

Presentation by:
British Approvals Service for Cables (BASEC)
Voltimum Webinar on Wednesday 17th February 2021
Contact the experts

call us on +(0)1908 267300
mail@basec.org.uk
Visit us at www.basec.org.uk

Mark Froggatt
Technical Director
mark.froggatt@basec.org.uk

Mathew Sharman
Commercial Manager
mathew.sharman@basec.org.uk

Jaya Skandamoorthy
Regional Technical Manager
jaya.skandamoorthy@basec.org.uk

Charlotte Terry
Marketing Executive
charlotte.terry@basec.org.uk
CONTENT

Part 1: Introduction to BASEC

Part 2: Fire Performance of Cables

Part 3: Certification, Testing & CPR

Part 4: The Value of Approved Cables

Part 5: Questions & Answers
1. Established in 1971
2. Long and stable history; Strong heritage and trust - impartial & independent.
3. Independent Third Party Approvals body accredited by UKAS.
4. Scope of certification covers power, control, signal and datacom cables.
5. Trusted and recognised in over 28 countries.

Our Purpose: “Continuously improving quality and safety.”
FIRE PERFORMANCE TESTING FOR CABLES

Market insights, evolution and understanding your challenges
Did you know?

Electrical **failures** and **malfunctions** are one of the highest causes of cable related fires.

Proper assessment and understanding of how a cable will **resist** or **react** to fire is therefore critical to your operations.

**The facts**

Burns account for an estimated 180,000 deaths every year – reports the World Health Organisation.

In England alone, 156,128 fires were attended by emergency services in the year ending June 2020.

However depending on which materials set alight, the smoke can be far deadlier than the flame.
Death caused by smoke and gas accounts for 44% of all deaths.

Gas and Smoke during fires claim 30,000 victims yearly in Europe.

The risk of fire is higher than ever before, due to the increase in the volumes of plastic and synthetic materials, and products in our homes – which have a much faster burn rate.

The average time from ignition to flashover in 1950 was 15 minutes.

In 1975 that reduced to 5 minutes.

Today, fatal conditions can occur in just 3 minutes.
Combustible materials: **fuel**, oxygen: **air** and ignition: **spark, heat** are the only necessary elements required to start a fire.

Electric cables are one of the few building products that can combine all three elements.
<table>
<thead>
<tr>
<th>Resistance to fire</th>
<th>Reaction to fire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognised as fire-rated cables, testing assesses continued circuit integrity in fire conditions</td>
<td>Recognised as flame retardant, testing resistance to spread of fire, flaming droplets, toxic gases and smoke</td>
</tr>
<tr>
<td>Includes testing in line with the Construction Products Regulation</td>
<td></td>
</tr>
</tbody>
</table>
CERTIFICATION, TESTING & CPR

Learn about cable testing services for fire performance properties
A key part of certification is to ensure that the claims of conformity made by cable manufacturers about their cable are valid.

The various cable standards refer to many supporting material standards, specifications and defined test methods.

The role of a third party testing house is to verify that the design, electrical, mechanical, material properties as well as any specialist performance needs, for reaction to chemicals or fire, meet the necessary requirements outlined.
Resistance to fire

Cable design standards
- BS 8592
- BS 7846
- BS 7629

Test methods
- BS 6387
- IEC 60331 series
- BS EN 50200
- BS 8434-2
- BS 8491

Furnace tests
Design standards

- **BS 8592** – non-armoured cables: resistance to fire, flame propagation and emission of smoke or corrosive gases
- **BS 7846** – categorisation of wire armoured cables to resistance to fire, with water and with mechanical shock – categories F2, F30, F60 and F120
- **BS 7629** – cables requiring low smoke halogen free properties, specification for 300/500 V fire resistant, screened, fixed installation cables having low emission of smoke and corrosive gases when affected by fire

Test methods

- **BS 6387** – CWZ: flame, flame & sprinkler, flame & indirect impact on 3 different samples
- **IEC 60331 series** – flame at 830 °C minimum
- **BS EN 50200** – flame, indirect impact & water spray at 830 °C
- **BS 8434-2** – flame with water spray & indirect impact at 930 °C
- **BS 8491** – flame with water spray & direct impact
- **Furnace tests** – cable tray mounted
Construction products regulation (CPR)
EN 60332-1-2
BS EN 50399
IEC / EN 61034-2
IEC / EN 60754-2
EN / ISO 1716

Additional to CPR
IEC 60332-3-21/22/23/24/25
Test methods

▪ **EN 60332-1-2** – single flame Bunsen burner
▪ **BS EN 50399** – vertical ladder
▪ **IEC / EN 61034-2** – smoke density
▪ **IEC / EN 60754-2** – acidity and conductivity
▪ **EN / ISO 1716** – heat of combustion

Test methods

▪ **IEC 60332-3-21** – Category A F/R
▪ **IEC 60332-3-22** – Category A
▪ **IEC 60332-3-23** – Category B
▪ **IEC 60332-3-24** – Category C
▪ **IEC 60332-3-25** – Category D
# CPR cable classification

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A_{ca}</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>B1_{ca}</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>B2_{ca}</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>C_{ca}</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>D_{ca}</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E_{ca}</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F_{ca}</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CPR Testing

BASEC UK
NB 2661

UKCA
System 1+ and
System 3

BASEC Conformity
Limited (BCL) NB 2851

System 1+
CPR AVCP
UKCA Product Marking

What is it?
- Stands for UK Conformity assessed
- Product quality marking for goods sold into the UK, as of 1st January 2021

What does this mean?
- Effectively replaces CE marking for cable products entering the UK market
- 12 month transition period where CE marked products are still allowed into the UK until 1st January 2022
- CE marking still applies to products exported to the EU
- BASEC is recognised as a UKCA approval body
- UKCA compliance will be noted on the DoP for products that have gained the marking
Fire test – Ladder Rig
3m Cube Smoke Emission Test
THE VALUE OF APPROVED CABLE

Safeguard critical cables through cable specification
Properly tested cabling allows peace of mind against the onset of fire in relation to:

- Continued operation during a fire
- How quickly fire could spread
- Total heat and smoke released
- Presence of flaming droplets

Ensuring **operation of emergency equipment** to alert building occupiers enough time to exit before the severity increases causes risk to life and lasting damage to infrastructures.
"The Fire Brigade continues to campaign for new regulations and independent third party approvals to improve the safety standards of products in their design, manufacture and application in buildings”

Charlie Pugsley, Deputy Assistant Commissioner - London Fire Brigade
The value of a BASEC approved cable

- Complete fire testing solutions
- Experts in rigorous cable testing and certification
- Testing to meet increasing fire performance requirements
- Verification of cable designs and constructions
- Independent, third party assessment outside of the manufacturer’s facilities
- Continuous auditing
- Selection of samples by third party expert to prevent testing of ‘golden samples’
- Product approvals permit the marking of BASEC on cables
Introduction to the Registered Stockist Scheme

Buy with confidence

The scheme ensures that the cable you purchase has maintained the same levels of quality since it left the manufacturer.

**Areas thoroughly reviewed:**

- Procurement
- Selling & compliance practises
- Preparation & storage of samples – eliminate golden samples
- Ensuring quality of products is maintained throughout journey from manufacturer to stockist
What you can do to protect your reputation

Take action by carrying out the below:

1. Specify **third-party approvals** during project planning

2. Take advantage of **BASEC’s suppliers’ network** – stockist selector tool

3. Receive **further education on cable quality**
The mark of quality that you can trust in.
Follow us on Social Media:

LinkedIn: BASEC – British Approvals Service for Cables

Twitter: @BASECCables

YouTube: BASEC

Access certifications at your convenience

Download the free BASEC App!

SCAN ME
Be part of the journey

Visit us at www.basec.org.uk
or call on +44 (0)1908 267 300