

FIRE TESTS

Cables have to be properly designed, manufactured and also tested. Many tests are carried out during manufacturing or as final inspections. Many of them are attended by customers or third part inspectors. The tests are part of R&D, an extremely strategic activity for a Company. You can find here the main tests concerning the behaviour of cables under fire conditions, and our main test equipments. It is important to verify all required performances and give the customers the full compliance to the requirements.

BS 6387

Following tests are carried out to verify if a cable is capable of maintaining circuit integrity under fire condition, fire with water, and fire with mechanical shocks. During the tests the cables are maintained at their rated voltage.

Fire Resistance (Cat. A B C S)

The cable is exposed to fire at the specified temperature and time.



Fire and Water Resistance (Cat. W)

The cable is exposed for 15 minutes to flame at 650° C and for additional 15 minutes to fire and water spray.



Fire Resistance with Mechanical Shocks (Cat. X Y Z)

The cable is mounted on a vertical panel and shocked with a steel bar for 15 minutes while submitted to the action of a flame.



BS EN 50200

Fire Resistance

This test is carried out to verify the circuit integrity of cables exposed to fire at 830° C and mechanical shocks.



Classification

PH 15	flame exposure for 15 min
PH 30	flame exposure for 30 min
PH 60	flame exposure for 60 min
PH 90	flame exposure for 90 min
PH 120	flame exposure for 120 min

BS EN 50200 Annex E
(Standard Cable – BS 5839-1 – Clause 26.2d)

Fire Resistance

This test is carried out to verify circuit integrity during a fire. The cable is exposed to a flame at 830° C and mechanical shocks for 15 minutes and additional 15 minutes to flame, mechanical shocks and water spray.



BS 8434-2
(Enhanced Cable – BS 5839-1 – Clause 26.2e)

Fire Resistance

This test is carried out to verify circuit integrity during a fire. The cable is exposed to a flame at 930° C and mechanical shocks for 60 minutes and additional 60 minutes to flame, mechanical shocks and water spray.



BS EN 61034-2, IEC 61034-2, CEI 20-37/3

Smoke Density

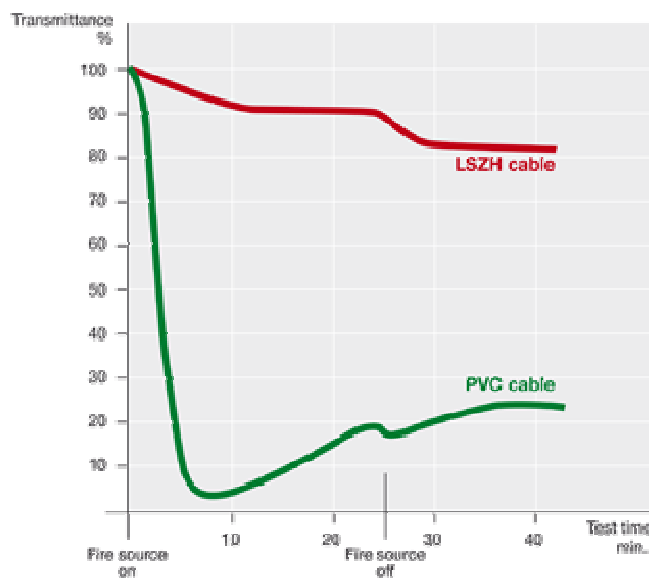
In a 3 m cube metal cabinet, samples of cables are burned by 100 cm³ of alcohol contained in a metal tray. A photometric system is based on a light source and a photocell placed horizontally in the mid vertical plane of the cube, at height of 2.15 m. Absorbance or light transmission are measured.



Standard

Required values

BS EN 61034-2, IEC 61034-2, CEI 20-37/3 (Transmittance - LT) $\geq 60\%$



IEC 60331, CEI 20-36

Fire Resistance

This test is carried out to verify circuit integrity even during a fire. A sample of cable is held on a flame at about 750° C for a period of minimum 90 min, under rated voltage.



No break or short circuit should occur. The test can also be performed in more severe conditions, up to 1100 ° C. Fibre optic cables can be tested in same conditions, monitoring the attenuation of the signal of one or more fibres.

Classification CEI 20-36/2-1 - IEC 60331-21 - Electrical cables up to 0,6/1 kV
CEI 20-36/2-3 - IEC 60331-23 - Data cables CEI 20-36/2-5 - IEC 60331-25 - Fibre optic cables

NF C 32-070

Fire Resistance

This test is carried out to verify circuit integrity during a fire. The cable is into a tubular oven with gradually increasing of temperature up to 920° C. The cable is stressed by mechanical shocks and subjected to tensile strength.



BS EN 60332-3, IEC 60332-3, CEI 20-22/3

Fire Propagation Test on Bunched Cables

Samples of cables 3,5 m long in quantities required by standard are installed on a ladder inside a metallic cabinet. They are subjected to the action of a flame at 750° C for a specific time (20 or 40 minutes). Cables must not burn for more than 2,5 m.



BS EN 60332-1, IEC 60332-1,
CEI 20-35/1 BS EN 60332-2,
IEC 60332-2, CEI 20-35/2

Flame Propagation Test on a Single Cable

A 60 cm long sample of cable is vertically fixed with two clamps inside a small cabin, open on the front. The cable is subjected to the action of a flame produced by a calibrated Bunsen burner. The application time of the flame is according to the cable diameter (60-480 seconds). At the end of the test the burnt portion of cable must not be 50 mm close to the higher clamp.



BS EN 50267-2-1, IEC 60754-1, CEI 20-37/2-1

HCl Emission

Each non metallic material of the cable (~1.0 g) is burnt into a tube furnace up to 800 ° C. A controlled air flow rate absorbs the generated gases in a appropriate solution. The titration of the solution allows to determine the developed hydrochloric acid (HCl) amount.



Standard

Required values

BS EN 50267-2-1, IEC 60754-1, CEI 20-37/2-1

≤0, 5% HCl

BS EN 50267-2-2, IEC 60754-2, CEI 20-37/2-2

Smoke Corrosivity

This test allows estimation of corrosiveness against metals of gases released when cables burn. Materials composing the cable are burnt into a tubular oven with temperature higher than 935 ° C. A controlled air flow rate absorbs the generated gases in a specific distilled water solution. pH and conductivity are finally measured.



Standard

Required values

BS EN 50267-2-2, IEC 60754-2, CEI 20-37/2-2

pH ≥4, 3 Conductivity
≤100 μ S. cm⁻¹