



Conducting Value

FIRECEL[®]

The Last Cable Standing

SR 114H Standard
for general purpose

SR 114E Enhanced
improved fire resistance



According to **BS 5839-1:2002** "Fire detection and fire alarm systems for buildings – Part 1: Code of practice for system design, installation, commissioning and maintenance", two different levels of cable fire resistance are specified.

For most application **"standard"** fire resistant cables can be used. However, for other applications, such as unsprinklered premises or buildings, in which the designer or specifier require an improved fire resistance, **"enhanced"** cables must be used.

The **main difference** between the **"standard"** and the **"enhanced"** requirements is **survival time** under test conditions: **30 minutes** for standard, **120 minutes** for enhanced. Furthermore test temperature for standard cables is **830 °C** compared to **930 °C** for enhanced one.

Standards

	Standard	Enhanced
FIRECEL	SR T14H	SR T14E
Circuit integrity	BS 5839-1:2002 Clause 26.2d EN 50200 PH 30 (PH 60) 830°C - 30 min. (60 min.) fire and mechanical shocks EN 50200 Annex E 830°C - 15 min. fire and mechanical shocks + 15 min. fire mechanical shocks and water spray	BS 5839-1:2002 Clause 26.2e + A2:2008 EN 50200 PH 120 830°C - 120 min. fire and mechanical shocks BS 8434-2:2003 +A2:2009 930°C - 60 min. fire and mechanical shocks + 60 min. fire mechanical shocks and water spray
	BS 6387:1994 - Category CWZ IEC 60331-21	
Fire propagation	BS EN 60332-3, BS EN 60332-1	
Acid Gas Emission	BS EN 50267, IEC 60754	
Smoke Density	BS EN 61034 (replaces BS 50268-2)	
Code of practice	BS 5839-1:2002 + A2:2008	
Basic Design	BS 7629-1:2008	

BS 5839-1 recommends **"enhanced"** fire resistant cables for the following applications:

- in unsprinklered buildings (or parts of buildings) in which the fire strategy involves evacuation of occupants in four or more phases;
- in unsprinklered buildings of greater than 30 m in height;
- in unsprinklered premises and sites in which a fire in one area could affect cables of critical signal paths associated with areas remote from fire, in which it is envisaged people will remain in occupation during the course of the fire;
- in any other buildings in which the designer, specifier or regulatory authority, on the basis of a fire risk assessment that takes fire engineering considerations into account, considers that the use of enhanced fire resisting cables is necessary.

BS 8519:2010 "Selection and installation of fire-resistant power and control cable systems for life safety and fire-fighting application"

- Category 1 - 30 minutes survival time: Tested to EN 50200 PH 30 + Annex E as per requirements for **"standard"** control cables.
- Category 2 - 60 minutes survival time: Tested to EN 50200 PH 60 + BS 8434-2 as per requirements for **"enhanced"** control cables.
- Category 3 - 120 minutes survival time: Tested to EN 50200 PH 120 + BS 8491 as per requirements for **"enhanced"** control cables.

BS 8519 does not cover the wiring of fire detection and fire alarm systems which are still covered by the BS 5839-1, BS 5839-8 and BS 5839-9 and emergency lighting systems which are still covered by the BS 5266-1.

For more information we recommend to consult BS 5839-1 Par.26 and BS 8519:2010 and BS 8491.



Quality System Certification

Assessed to
ISO 9001: 2008
Certificate number 217



Product Certification

No. 217f / 217g
assessed to BS 7629-1
and BS 5839-1: 2002

Features and Advantages

Flexible

Very flexible construction that makes the installation easier in all conditions.

LSZH (Low Smoke Zero Halogen)

Combustion gases with very low toxicity, low smoke emission, and no corrosive gas, for the safeguard of human life and electronic equipment.

Flame retardant

Limiting the spread of the fire along the cable run, flame barriers can be avoided or reduced.

Protected against electrostatic noise

Cable is fully screened and conductors are twisted.

Moisture resistant

No special terminals are required to prevent moisture absorption. It can be installed in damp environments.

Suitable for data transmission

Twisting of conductors make the cable suitable for clear data transmission.

Low cost installation

Neither special tools, nor special training are necessary. A cheap and effective cable stripper is available on request to simplify installation.
Easy to handle.

Quality Assurance

In order to satisfy QA requirements, traceability is assured by batch number printed on outer jacket.
All reels have the evidence of testing.

Applications

- Hotels
- Theatres and cinemas
- Museums
- Hospitals
- Shopping centres
- Offices
- Schools
- Airports
- Undergrounds and tunnels
- Railway stations
- High-rise buildings
- Data communication centres
- Public address systems
- Traffic control systems
- Fire fighting systems

FIRECEL SR 114H

Silicone Insulation

Overall Screen

Standard Cable

BS 5839-1:2002 Clause 26.2d

EN 50200 PH 30 (PH 60) 830°C - 30 min. (60 min.)
fire and mechanical shocks

EN 50200 Annex E 830°C - 15 min. fire and
mechanical shocks + 15 min. fire mechanical
shocks and water spray

BS 6387

Cat. C fire @ 950°C - 180 min

Cat. W fire and water @ 650°C - 15 + 15 min.

Cat. Z fire and mechanical shocks
@ 950°C - 15 min.

- **SR 114H** solid conductor 300/500 V
- **SR 114H-R** stranded conductor 300/500 V



Cables up to 4 cores
approved by LPCB,
certificate N° 217f

Applications

FIRECEL SR 114H are primarily intended for general application.

Typical applications are:

- **BS 5839-1** for **standard** fire resistant cables in fire detection and fire alarm systems for building
- **BS 5839-8** for voice alarm systems
- **BS 5839-9** for emergency voice communication systems.
- **BS 5266-1** for emergency lighting of premises (PH60)
- **BS 8519** for fire-resistant control cable systems for life safety and fire-fighting application - Category 1

Operating temperature

-40°C to +90°C



Cable construction

Conductors

Plain annealed copper wire, solid class 1 or stranded class 2 according to EN 60228.

Insulation

High performance fire resistant silicone rubber type EI2 to BS EN 50363-1.

Cabling

Insulated cores are cabled together.

Overall screen

Aluminium/polyester tape.

Circuit protective conductor or drain wire

Uninsulated tinned copper conductor of the same section and class as the insulated conductors in the 2-, 3- and 4-core cables. Drain wire of 0.5 mm² tinned copper conductor is provided in cables with more than 4 conductors.

Outer sheath

LSZH thermoplastic material type LTS3 to BS 7655-6.1.

Colour red or white (other colours on request).

Colour code up to 4 cores to HD 308

2 cores	blue - brown
3 cores	brown - black - grey
4 cores	blue - brown - black - grey
7 cores	centre: brown 1st layer: brown - black - 4 cores white
12 cores	centre: brown - black - white 1st layer: brown - black - 7 cores white
19 cores	centre: brown 1st layer: brown - black - 4 cores white 2nd layer: brown - black - 10 cores white

(on request the cores can be one colour only, identified by printed numbers)

Applicable Standards

Basic design

BS 7629-1

Fire resistant

BS 6387 (cat. C-W-Z)

EN 50200 (class PH30 and PH60)

EN 50200 annex E (fire, mechanical shock and water spray)

Flame retardant

EN 60332-1-2

Acid gas emission

EN 50267-2-1

Smoke density

EN 61034-2

N° of cond. x cross section (mm ²)	Size of conductors (n°/mm)	Size of earth wire (n°/mm)	Outer diameter (mm)	Weight (kg/km)	P clips type
1 mm² solid					
2x1.0	1/1.13	1/1.13	7.1	70	AC7
3x1.0	1/1.13	1/1.13	7.6	85	AC8
4x1.0	1/1.13	1/1.13	8.3	110	AC8
7x1.0	1/1.13	1/0.80*	10.0	165	AC11
12x1.0	1/1.13	1/0.80*	12.5	255	AC12
19x1.0	1/1.13	1/0.80*	15.0	380	AC16
1.5 mm² solid					
2x1.5	1/1.38	1/1.38	8.0	95	AC8
3x1.5	1/1.38	1/1.38	8.5	115	AC8
4x1.5	1/1.38	1/1.38	9.4	140	AC9
7x1.5	1/1.38	1/0.80*	11.3	225	AC11
12x1.5	1/1.38	1/0.80*	14.5	340	AC14
19x1.5	1/1.38	1/0.80*	17.0	520	AC16
1.5 mm² stranded					
2x1.5	7/0.53	7/0.53	8.4	100	AC8
3x1.5	7/0.53	7/0.53	8.9	125	AC9
4x1.5	7/0.53	7/0.53	9.8	155	AC11
2.5 mm² solid					
2x2.5	1/1.75	1/1.75	9.4	130	AC9
3x2.5	1/1.75	1/1.75	10.0	170	AC11
4x2.5	1/1.75	1/1.75	11.0	210	AC11
2.5 mm² stranded					
2x2.5	7/0.67	7/0.67	9.9	145	AC11
3x2.5	7/0.67	7/0.67	10.3	180	AC11
4x2.5	7/0.67	7/0.67	11.7	230	AC11
4 mm² stranded					
2x4	7/0.85	7/0.85	11.5	200	AC11
3x4	7/0.85	7/0.85	12.2	260	AC12
4x4	7/0.85	7/0.85	13.5	330	AC13

* drain wire

approximate values

Electrical Characteristics

Voltage rating	single or three phase circuit up to 300/500 V r.m.s. or up to 750 V d.c. circuit			
Temperature rating - for insulated conductors only	-40 ÷ +90 °C max +200 °C			
Cross section (sq mm)	1	1.5	2.5	4
Conductor resistance (Ω/km at 20 °C)	18.1	12.1	7.41	4.61
Insulation resistance (MΩxkm at 20 °C)	300	300	300	300
Nominal Capacitance (pF/m)				
SR 114H - core/core	100	110	130	160
- core/screen	170	190	220	270
SR 114E - core/core	95	100	120	150
- core/screen	160	170	200	250

Current Ratings and Voltage Drop¹

Size of conductor (sqmm)	installation method: clipped direct				installation method: in conduit or in cable tray			
	1 two-core cable		1 three/four-core cable		1 two-core cable		1 three/four-core cable	
	current rating	voltage drop x A x m cos w = 1	current rating	voltage drop x A x m cos w = 1	current rating	voltage drop x A x m cos w = 1	current rating	voltage drop x A x m cos w = 1
(sqmm)	A	mV	A	mV	A	mV	A	mV
1.0	19	45	17	39	17	45	15	39
1.5	24	30	22	26	22	30	19.5	26
2.5	33	18	30	15	30	18	26	15
4.0	45	11	40	10	40	11	35	10

¹ Conductor operating temperature: 90 °C; Ambient temperature: 30 °C.

Rating Factors

Ambient temp. (°C)	25	30	35	40	45	50	55	60	65			
Rating factor	1.04	1.00	0.95	0.90	0.85	0.80	0.74	0.67	0.60			
For grouping												
Number of cables	2	3	4	5	6	8	10	12	14	16	18	20
Rating factor	0.80	0.70	0.65	0.60	0.57	0.52	0.48	0.45	0.43	0.41	0.39	0.38

Armouring

FIRECEL cables can be supplied with:

SWA

Steel Wire Armour

SWB

Steel Wire Braid



Cable Installation

Ambient Temperature

FIRECEL cables are easy to install also at temperature as low as -10 °C.
Storage temperature: -40 °C to +80 °C.

Bending Radius

Minimum 6 times the nominal diameter of the cable.

Installation

Cable is easy to handle and easy to install without special tools.
Cable can be fixed directly to a surface using **LSZH coated copper P clips** or **Saddle clips**, available together with cables.
Plastic clips must not be used.
Cable can also be installed in cable tray or in conduits, or direct buried in plaster.
Suitable for outdoor installation too, in appropriate protected environments.



Glands

For standard installation, general purpose nylon glands can be used.
In explosion proof area suitable proof glands can be used with armoured cables.



Available colours: white/red.

Fire Tests



FIRECEL cables are **tested and certified** by a third part laboratory. Anyway in Cavicel **all tests** related to fire are **inhouse performed** on a regular base, to get a very high trust **to assure Customers the complete safety.**