FEICHUN SPECIAL CABLE — BS 8519 FIRE SURVIVAL ENGINEERING

What Is BS 8519:2020? Category 1, 2 & 3 Fire-Resistant Power and Control Cable Systems Explained

A Practical Engineering Guide to 30 / 60 / 120-Minute Fire Survival. Category 1, Category 2 and Category 3 Power vs Control Circuits. BS 7846 F30/F60/F120. BS 8491. BS EN 50200. BS 8434-2. BS 7629-1. BS 8592. Annex D. Mechanical Protection. Cable Supports. Joints and Terminations. Diverse Routes. Fire-Temperature Cable Sizing. Procurement and BOQ Examples.

BS 8519:2020 耐火电力与控制电缆系统工程指南：30 / 60 / 120 分钟 Category 1 / 2 / 3，Power 与 Control 的区别，BS 7846 F30/F60/F120、BS 8491、BS EN 50200、BS 8434-2、BS 7629-1、BS 8592、Annex D，以及支撑、接头、终端、双路由和采购规格写法。

Anhui Feichun Special Cable Co., Ltd. | Aug 12, 2026 | Engineering Guide

CONTENTS

1. What Is BS 8519:2020?
2. Category 1, 2 and 3: 30 / 60 / 120 Minutes
3. Power vs Control: Why They Must Be Separated
4. Category 1 Power
5. Category 2 Power
6. Category 3 Power and BS 7846 F120
7. Category 1 & 2 Control
8. Category 3 Control
9. How BS 7846 and BS 8491 Fit Together
10. BS 7629-1, BS 8592 and Small Control Circuits
11. System Integrity: Supports, Joints and Terminations
12. Power Supplies, Diverse Routes and Fire Strategy
13. Cable Sizing Under Fire Conditions
14. Typical Applications
15. Correct BOQ / Procurement Specification
16. Common Specification Mistakes
17. References and Further Reading

1. What Is BS 8519:2020?

DIRECT ANSWER

BS 8519:2020 is not a cable manufacturing standard. It is a British code of practice for the selection and installation of fire-resistant power and control cable systems used for life safety, fire-fighting and other critical applications. It links required circuit survival to suitable cable products, fire tests, supply arrangements, routes, mechanical protection, supports, joints and terminations.

A purchase order that states only “BS 8519 cable” is incomplete. The correct route is to define the **Category**, then distinguish **Power** from **Control**, then state the product standard, relevant fire tests, voltage, cores, conductor size and installation requirements.

> *BS 8519:2020 不是某一种固定结构的电缆产品标准，而是关键耐火供电与控制回路的选型和安装规范。采购时必须继续写清 Category、Power / Control、产品标准、耐火试验、额定电压、芯数、截面与机械保护。*

```
BS 8519 Category → Power / Control → Product Standard → Fire Test → Voltage → Cores / CSA →
                                    Mechanical Protection → Installed System
```

2. Category 1, 2 and 3: 30 / 60 / 120 Minutes

TABLE 1 — BS 8519 FIRE-SURVIVAL CATEGORIES

CATEGORY	FIRE SURVIVAL	TYPICAL DESIGN ROLE
Category 1	30 min	Initial life-safety operation and shorter-duration critical circuits
Category 2	60 min	Extended life-safety and selected fire-fighting functions
Category 3	120 min	Highest BS 8519 category for prolonged fire-fighting and critical operation

The category number alone does not define the cable. A Category 3 power circuit and a Category 3 control circuit both target 120-minute survival but can require different cable constructions and test routes.

3. Power vs Control: Why They Must Be Separated

TABLE 2 — POWER AND CONTROL CIRCUITS UNDER BS 8519

ITEM	POWER CIRCUIT	CONTROL CIRCUIT
Typical Duty	Motors, pumps, fans, lifts and other power equipment	Control, interlocking, signalling, monitoring and actuator circuits
Typical Cable Family	BS 7846 armoured fire-resistant power cables	BS 7629-1, BS 8592 or other applicable fire-resistant control constructions
Key Fire Tests	BS 8491 is central for large-diameter power cables	BS EN 50200, BS 8434-2 and BS 8519 Annex D as applicable
Mechanical Protection	Often integral through SWA or equivalent robust construction	May be integral or externally provided, especially for Category 3

COMMON MISTAKE

“BS 8519 Category 3 cable” is still incomplete. The specification must say **Category 3 Power** or **Category 3 Control**.

4. Category 1 Power

Category 1 Power corresponds to a 30-minute fire-survival requirement. For applicable BS 7846 / BS 8491 power-cable constructions, an F30 route can be used where the product size and certification scope support it.

```
Typical Route — Category 1 Power
BS 8519 Cat 1 Power + BS 7846 F30 / BS 8491 30 min, where applicable
```

5. Category 2 Power

Category 2 Power targets 60 minutes. For applicable armoured fire-resistant power cable constructions, an F60 / BS 8491 60-minute route is a common engineering solution.

```
Typical Route — Category 2 Power
BS 8519 Cat 2 Power + BS 7846 F60 / BS 8491 60 min, where applicable
```

6. Category 3 Power and BS 7846 F120

TYPICAL HIGH-DUTY SPECIFICATION

BS 8519 Category 3 Power + BS 7846 F120 + BS 8491 120 min + 600/1000V is a widely used engineering route for high-duty fire-fighting power circuits.

Typical applications include fire-fighting or evacuation lifts, wet-riser pumps, sprinkler pumps, smoke and heat exhaust ventilation equipment, and stair pressurisation systems.

A typical cable construction uses Class 2 copper conductors, a fire-resistant barrier, thermosetting insulation, LSHF bedding, steel wire armour and an LSHF outer sheath. Final conductor size must consider normal ampacity, voltage drop, motor starting, short-circuit duty and fire-temperature effects.

> *Category 3 Power 常见写法：BS 8519 Cat 3 Power + BS 7846 F120 + BS 8491 120 min + 0.6/1 kV，再补充芯数、截面、SWA、LSHF及有效第三方认证范围。*

7. Category 1 & 2 Control

Small control cables follow a different test route from large armoured power cables. BS EN 50200 assesses circuit integrity under flame and mechanical shock, while BS 8434-2 is used for more severe combined fire-performance requirements.

TABLE 3 — SIMPLIFIED CONTROL-CIRCUIT LOGIC

CONTROL CATEGORY	SURVIVAL TARGET	TYPICAL EVIDENCE
Category 1 Control	30 min	PH30 plus applicable BS 8519 supplementary requirements and suitable product construction
Category 2 Control	60 min	PH60 together with applicable BS 8434-2 / BS 8519 requirements

PH30 or PH60 alone does not automatically prove BS 8519 compliance. Product standard, complete test route, mechanical protection and installed-system requirements must be reviewed together.

8. Category 3 Control

Category 3 Control is particularly important in the 2020 edition. Public manufacturer guidance notes the additional need for 120-minute survival under BS 8434-2 alongside the other applicable BS 8519 requirements.

```
Typical Cat 3 Control Evidence Chain
BS EN 50200 PH120 + BS 8434-2 120 min + BS 8519 Annex D, where applicable + Mechanical Protection
```

> **DO NOT OVERSIMPLIFY**
>
> **PH120 is not automatically BS 8519 Category 3 Control.** “Enhanced 120” or “CWZ” should not be used as shorthand for the complete Cat 3 Control compliance route.

Mechanical protection is part of the design. It can be integral, such as armour, or external, such as a suitable metallic protection system, depending on the selected cable construction and installation.

9. How BS 7846 and BS 8491 Fit Together

BS 7846 is the product standard for 600/1000V armoured fire-resistant power cables. **BS 8491** provides a fire-integrity test route for large-diameter power cables. **BS 8519** is the system selection and installation code that determines which fire-survival level the circuit needs.

```
BS 8519 = System selection & installation
BS 7846 = Fire-resistant power cable product standard
BS 8491 = Fire integrity test route for large-diameter power cables
```

TABLE 4 — COMMON POWER-CABLE MAPPING

BS 8519 POWER CATEGORY	SURVIVAL	COMMON ROUTE
Category 1 Power	30 min	F30 / BS 8491 30 min, where applicable
Category 2 Power	60 min	F60 / BS 8491 60 min, where applicable
Category 3 Power	120 min	F120 / BS 8491 120 min

10. BS 7629-1, BS 8592 and Small Control Circuits

BS 7629-1 is widely used for fire-resistant screened multicore cables in fire alarm, emergency and control applications. Its own product classifications should not be treated as identical to BS 8519 Category 1, 2 and 3.

BS 8592 covers single-core fire-resistant fixed wiring cables. In appropriate applications they can form part of a mechanically protected BS 8519 wiring system, for example in a suitable screwed steel conduit arrangement.

> **KEY BOUNDARY**
>
> **BS 7629-1 Enhanced 120 is not automatically equal to BS 8519 Category 3 Control.**

11. System Integrity: Supports, Joints and Terminations

BS 8519 is fundamentally a **system standard**. A cable may survive the required fire exposure while the circuit still fails early because a support collapses, a joint opens or a termination loses mechanical integrity.

TABLE 5 — SYSTEM COMPONENTS THAT CAN BECOME THE WEAKEST LINK

COMPONENT	FAILURE RISK	ENGINEERING CHECK
Cable Cleats / Supports	Softening, distortion, detachment	Fire-compatible support type and spacing
Tray / Ladder	Deformation and cable collapse	Fire duty, loading and fixing arrangement
Joint	Electrical or insulation failure	Validated fire-resistant joint system
Gland / Termination	Loss of armour continuity or conductor security	Correct matched gland and termination system
Fire Stopping	Loss of compartmentation	Compatible tested penetration-sealing system

> *BS 8519 真正考核的是完整耐火回路。支撑、桥架、接头、终端或防火封堵任何一点提前失效，都可能使耐火电缆本身的性能失去意义。*

12. Power Supplies, Diverse Routes and Fire Strategy

Critical equipment can lose power even when the cable remains intact. Normal-source failure, common-route fire damage, switchgear failure and changeover-device failure all need to be considered.

```
Primary Supply → Switchgear / Changeover → Fire-Resistant Route → Local Control → Critical Load
Secondary Supply / UPS → Diverse Route → Same Critical Load
```

Whether dual supplies, UPS systems or physically diverse routes are required depends on the fire strategy and the specific life-safety or fire-fighting system.

13. Cable Sizing Under Fire Conditions

Conductor resistance increases with temperature. During fire conditions this increases voltage drop and can affect the ability of pumps, fans and lifts to continue operating. Normal-operation sizing alone may therefore be insufficient.

> **SIZING NOTE**
>
> Public engineering guidance on BS 8519:2020 notes that where detailed manufacturer guidance or full fire-condition calculation is unavailable, a default increase of **two standard conductor sizes** may be used. It should not replace project-specific calculation when adequate data are available.

14. Typical Applications

TABLE 6 — TYPICAL BS 8519 APPLICATIONS

SYSTEM	POWER CIRCUIT	CONTROL CIRCUIT	MAIN CONCERN
Fire-Fighting / Evacuation Lift	High-duty fire-resistant supply	Control, status, interlocking	Extended operation
Sprinkler Pump	Motor supply	Start / feedback	Starting voltage drop + survival
Wet-Riser Pump	Motor supply	Control / monitoring	High current + long fire duty
SHEV / Smoke Exhaust	Fan / actuator supply	Control / interlocking	Operation during fire and water exposure
Stair Pressurisation	Fan supply	Control / status	Protected escape and fire-fighting routes

15. Correct BOQ / Procurement Specification

> **PROCUREMENT CHECKLIST**
>
> **1.** BS 8519 edition: 2020
>
> **2.** Category: 1 / 2 / 3
>
> **3.** Circuit type: Power / Control
>
> **4.** Fire survival: 30 / 60 / 120 min
>
> **5.** Product standard: BS 7846 / BS 7629-1 / BS 8592 / other applicable standard
>
> **6.** Fire test route: BS 8491 / BS EN 50200 / BS 8434-2 / Annex D as applicable
>
> **7.** Voltage, cores, conductor size and conductor class
>
> **8.** Armour / mechanical protection and LSHF requirements
>
> **9.** Supports, joints, terminations and fire stopping
>
> **10.** Third-party certificate scope and project fire strategy

Example A — Category 3 Power

```
4C × 70 mm² Cu, 0.6/1 kV, SWA, LSHF
BS 7846-F120 + BS 8491 120 min
Suitable for BS 8519:2020 Category 3 Power
Subject to exact certificate scope and project fire strategy
```

Example B — Category 3 Control

```
7C × 1.5 mm² Fire-Resistant Control Cable
BS 8519:2020 Category 3 Control
PH120 + BS 8434-2 120 min + Annex D where applicable
Integral or external mechanical protection as required
```

16. Common Specification Mistakes

TABLE 7 — WHAT NOT TO WRITE

INCOMPLETE / WRONG EXPRESSION	WHY IT IS A PROBLEM	BETTER APPROACH
“BS 8519 cable”	No category and no Power / Control distinction	State complete performance chain
“Cat 3 = F120”	Only meaningful for the applicable power-cable route	First identify Power vs Control
“PH120 = Cat 3 Control”	Omits additional BS 8519 requirements	Check full Cat 3 Control test route
“CWZ = BS 8519 Cat 3”	Different test framework	Do not substitute CWZ for the full BS 8519 route
“Fire-resistant cable = compliant system”	Ignores supports, joints, routes and supplies	Assess the complete installed circuit

17. References and Further Reading

Public engineering references. Formal projects should be checked against licensed standards, the project fire strategy and valid product certification.

Standards and Primary Industry Sources

[1] British Standards Institution. BS 8519:2020.

[2] Prysmian UK. BS 8519:2020 — key changes.

[3] Prysmian UK. FP500 — Category 3 Control example.

[4] Prysmian UK. FP600s — BS 7846 F120 / BS 8491 120 min / BS 8519 Category 1, 2 and 3 Power.

[5] Prysmian UK. What’s changed since the CWZ test?

[6] BASEC. Fire Rated Cables Explained: Design Standards and Critical Fire Tests, Feb 10, 2026.

[7] BASEC. Certificate 202/002/010 — BS 7846:2015 F120 example.

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PROJECT SUPPORT
BS 8519 Category 1 / 2 / 3 Power & Control Cable Selection

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