



# Fire Protection and cables acc. to the CPR

Topical booklet no. 0009



# SAMCON

Prozessleittechnik GmbH

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## Revision history

Rev.- Index	Date	Name	Comment
00	Feb 24 <sup>th</sup> 2026	S.Heinz	Compilation of the document

## 1 Introduction

What does fire protection have to do with cables and wires? What do operators and installers of systems need to consider when selecting cables if these are to be permanently installed in buildings? This document is intended to highlight hazards and explain, based on the legal framework, what needs to be considered when selecting suitable cables. It is a supplement or extension to our TB005 brochure “Cables and wires for hazardous areas” and our technical report “Cables and wires for explosion-proof areas” and refers only to the fire behavior of cables. Despite thorough research and many years of experience, this document does not claim to be accurate or complete.

## 2 What is the CPR?

The European **C**onstruction **P**roducts **R**egulation (CPR) EU 305/2011 is a legal regulation applicable in the EU. It defines basic safety requirements for buildings. One of these safety requirements is fire protection. The Construction Products Regulation establishes uniform product and testing standards for construction products. Construction products are defined as all goods that are permanently installed in buildings. Since July 1, 2017, the CPR also includes cables and wires that are permanently installed in buildings.



If cables and wires are permanently installed in buildings, the Construction Products Regulation is binding for all EU member states. Cables and wires must undergo special tests in order to determine their behavior in the event of a fire.



Figure 2-1: Cable with flame

### 3 The European fire classes for cables according to EN 50575

Cables are subjected to special tests in order to assess the degree of fire hazard they pose. An independent testing and certification institute tests cables and wires for general use in buildings with regard to fire behavior requirements based on **EN50575:2014+A1:2016**. If the cable meets the applicable limit values, it is assigned to a CPR class from A<sub>ca</sub> (non-combustible) to F<sub>ca</sub> (highly flammable) based on specific classification criteria. The cables are divided into the following fire classes based on the test results.

#### 3.1 Main classes

The following list shows the six main classes and their significance for heat development during flame spread.

- **A<sub>ca</sub>**: Non-combustible
- **B1<sub>ca</sub>/B2<sub>ca</sub>**: Very high, flame retardant
- **C<sub>ca</sub>**: high, flame retardant
- **D<sub>ca</sub>**: Medium, normal flammability
- **E<sub>ca</sub>**: Low, normal flammability
- **F<sub>ca</sub>**: Highly flammable or no requirement

Incidentally, “ca” stands for cable. A single test of the cable is sufficient up to fire class D<sub>ca</sub>. If you want to certify a higher fire class (C<sub>ca</sub>, B<sub>ca</sub>), the cable must be tested regularly (about once a year).

#### 3.2 Additional tested properties

The following classifications can be made:

- **Smoke development (s)**: s1 (low), s2 (medium), s3 (high)
- **Burning dripping (d)**: d0 (no burning dripping), d1 (limited), d2 (no performance detected)
- **Acidity (a)** (corrosive effect of gases): a1 (low, less corrosive, produce less corrosive gases in case of fire), a2 (medium), a3 (high)

The fire classes are mandatory for cables that are permanently installed in buildings.

### 3.3 Fire class of the cable and building safety

The choice of the right fire rating depends on the fire protection concept and the safety requirements of the building in question.

In Germany, E<sub>ca</sub> is the minimum requirement, but higher ratings are often recommended.



The fire rating of the cable must meet the safety requirements of the building in question.

Very high safety requirements in the building → Fire class B<sub>2ca</sub>

High safety requirements in the building → Fire class C<sub>ca</sub>

Medium safety requirements → Fire class D<sub>ca</sub>

And low safety requirements → Fire class E<sub>ca</sub>

Fire class	Additional criterias			Building – Safety class
	Flame spread / Heat development	Smoke development	Burning dripping	
<b>B<sub>2ca</sub></b>	s1	d1	a1	Very high
<b>C<sub>ca</sub></b>	s1	d1	a1	High
<b>D<sub>ca</sub></b>	s2	d2	a1	Medium
<b>E<sub>ca</sub></b>				Low

Tab.3-1: Fire class of the cable and building safety

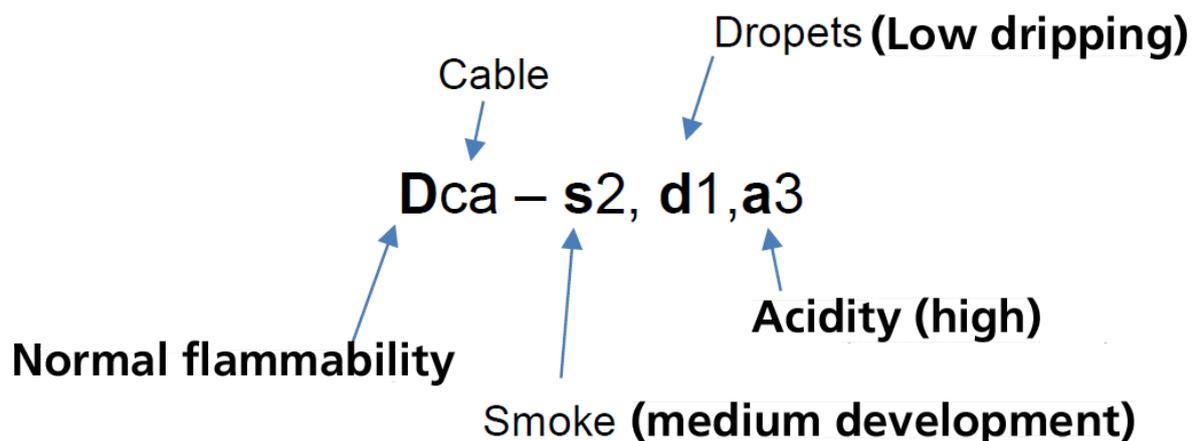
## 4 What exactly is being tested / confirmed?

The behavior of cables and insulated wires in the event of fire is tested using general test methods. Heat release and smoke generation are measured during the flame spread test (DIN EN 50399 (VDE 0482-399):2017-02, EN 50399:2011 + A1:2016).

The smoke density of cables and insulated wires when burning under defined conditions (DIN EN 61034-2 (VDE 0482-1034-2):2021-02, EN 61034-2:2005 + A1:2013 + A2:2020) as well as the vertical flame spread on a conductor, an insulated wire, or a cable (e.g., test method with a 1 kW flame with a gas / air mixture) (DIN EN 60332-1-2 (VDE 0482-332-1-2): 2022-07, EN 60332-1-2:2004 + A1:2015 + A11:2016 + A12:2020).

## 5 What do the tests indicate?

The VDE Testing and Certification Institute has tested our cable and classified its fire behavior as follows:



For buildings with higher safety requirements, at least fire class C<sub>ca</sub> is recommended. Our cables and wires are only classified as class D<sub>ca</sub> because they are not tested annually. Can they still be used?

## 6 Flame resistance

**Section 9.3.9 of IEC/EN 60079-14** also defines the requirements for flame propagation of cables in hazardous areas.

Our hazardous area cables are **flame-retardant in accordance with IEC 60332-1-2 and IEC 60332-2-2**. Specifically, this means that the cable is “ignited” with a 1 kW flame and the flame must not spread. Otherwise, an ignitable spark from a fire in the safe area would be transmitted via the cable to the hazardous area, which would inevitably lead to an explosion. The standard specifies the options of fire-resistant installation or fire barriers if flame-retardant cables are not available for these applications; fire bulkheads are also frequently used in practice.

Where possible, flame-retardant cables should be used in the design.

## 7 SAMCON Cables – Overview and possible applications

An overview of our [cables](#) and their properties can be found in the following table

# ExCam Series - Cable Comparison Matrix



Product	Material	Construction	Outer diameter	Armouring	Harmless	Ex meets requirements acc. to IEC/EN 60079-14 Chapter 9.3.	avoids inter-zone gas-transfer acc. to IEC/EN 60079-14 Appendix E.	Fire protection classification	T <sub>min</sub> T <sub>max</sub>	Sunlight resistant	Flame retardant	Oil resistant	Mud resistant	Additional Power element	PoE+	tested acc. *see legend	Further Information
SKD02-T	PUR	4x2xAWG23/1 shielded	8.9 ± 0.3 mm	✗	✓	✓	✓	E <sub>ca</sub> ***	-60°C +80°C	✓	✓	✓	✓	✗	✓	✓	
SKD03-T	PUR	4x2xAWG23/1 shielded GN JWW 3G1.5	12.4 ± 0.3 mm	✗	✓	✓	✓	D <sub>ca</sub> -2d0a3	-60°C +80°C	✓	✓	✓	✓	✓	✓	✓	
SKD04-T flex	PUR	4x2xAWG24/7 shielded	8.7 ± 0.3 mm	✗	✓	✗	✗	E <sub>ca</sub> ***	-60°C +80°C	✓	✓	✓	✓	✗	✓	✓	
SKD05-HT	FEP	4x2xAWG26/7	6.6 ± 0.2 mm	✗	✓	✓	✓	E <sub>ca</sub> ***	-50°C +150°C	✓	✓	✓	✓	✗	✗	✗	
ASKD02-T	PUR	4x2xAWG23/1 shielded	12.0 ± 0.4 mm	✓	✓	✓	✓	E <sub>ca</sub> ***	-60°C +80°C	✓	✓	✓	✓	✗	✓	✓	
ASKD03-T	PUR	4x2xAWG23/1 shielded GN JWW 3G1.5	15.5 ± 0.6 mm	✓	✓	✓	✓	D <sub>ca</sub> -2d1a3	-60°C +80°C	✓	✓	✓	✓	✓	✓	✓	

\* The cable is tested according to the following standards: IEEE 802.3 : Ethernet 10Base-T, Fast Ethernet 100Base-T, Gigabit Ethernet 1000Base-T @ 95-meter  
 \*\* The cable is only tested for PoE+  
 \*\*\* Fire behaviour - Upgrade to DoC in progress

Tab.7-1: Cable Comparison-Matrix

The status of fire protection labeling for our cables is as follows:

<b>Product/Model</b>	<b>Fire behavior</b>
<b>SKD02-T</b>	E <sub>ca</sub> ; Upgrade D <sub>ca</sub> in progress
<b>SKDP03-T</b>	D <sub>ca</sub> – s2, d0, a3
<b>SKD04-T.flex</b>	Flexible cable not suitable for permanent installation
<b>SKD05-HAT</b>	Not suitable, not halogen-free
<b>ASKD02-T</b>	E <sub>ca</sub> ; Upgrade D <sub>ca</sub> in progress
<b>ASKDP03-T</b>	D <sub>ca</sub> – s2, d1,a3

Tab.7-2: Status of fire protection labeling

Many of our cables offer the option of upgrading.

## 8 Final remark

If you want to install a cable permanently in a building, choose a cable that has been tested in accordance with the safety requirements for your building. This will reduce the risk of fire.

The aim of this brochure was to explain in simple and basic terms the importance of cable selection in terms of fire behavior for building safety. Much has been omitted. The brochure is intended to provide a brief overview and aid decision-making.

If you have any comments on this brochure, please feel free to contact us.

## 9 Sources and further documents

<https://www.lapp.com/en/de/products/properties-and-technologies/certificates-and-standards/construction-products-regulation-cpr/e/000191>

<https://www.easylan.de/en/info-center/blog/baupvo-2>

Topical booklet „[TB005 „Cables and Lines for haz. Areas“](#)“

Report „[Cables and Lines for Hazardous Areas“](#)“

DIN EN 60079-14 (VDE 0165-1):2009-05

VDE Audit Report

## 10 Notes



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