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NEW EUROPEAN STANDARD

Construction Products Regulation (CPR)
applied to Fiber-Optic cables

WHITE PAPER

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INTRODUCTION

2017 was the year of optical fiber. The French government's Superfast Broadband Plan deployed fiber across France through the 96 Public Initiative Networks (PINs). Fiber is now present in many domains, including construction.

The Construction Products Regulation (CPR) No. 305/2011, which came into effect on July 1, 2013, replaces the European Construction Products Directive 89/106/EEC and redefines fire safety in the construction field. The CPR sets the new requirements that construction products must meet in all EU countries.
Finally, cables' fire reaction and behavior, as well as the emission of dangerous substances when they burn, have been standardized.

The CPR applied to cables concerns all energy, control and communication wires and cables to be permanently incorporated in construction works, including civil engineering buildings that are subject to performance requirements in terms of fire reaction and/or resistance.

These new standards apply in each European Union country through the EN 50575 2014 standard, published on June 10, 2016, to facilitate the circulation of products within European Union member countries.

Knowledge of the different standards applicable to fiber-optic cables is essential in order to optimally define the choice of products in network deployment.

WHAT IS THE PURPOSE OF THE CPR ?

A. Fire safety

A FEW FIGURES:

EACH YEAR
IN FRANCE

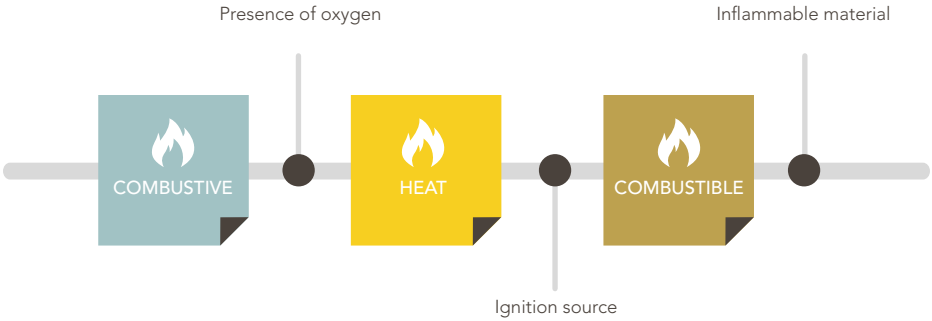
250,000
fires are reported on average, which is one house fire every two minutes.

10,000
injured (of which 3,000 seriously).

800
deaths due to fire.

75%
of which are caused by asphyxia from the smoke and gas emitted.

There may be multiple causes of fire (defective or poorly installed equipment, dangerous counterfeits, a heat source outside the installation, etc.), but the propagation of fire is one of the most crucial factors in fire safety.



The primary role of the CPR is to strengthen the fire performance assessment criteria in order to limit the propagation of fire and smoke and chemical substance emissions that may be present in construction products.

B. European harmonization

The CPR applied to cables harmonizes the standards in terms of fire performance requirements for construction products: it is intended to be simpler and more effective.

For this, it groups 3 major standards that define a common language in order to harmonize fire performance assessment methods across all EU countries:

EN 13501-6

EN 13501-6 classification standard:
List of fire reaction classes, in order to establish a common language for fire reaction performance at European level.

EN 50399

EN 50399 standard:
Lists the testing equipment and the calibration and testing methods.

hEN 50575

Harmonized product standard hEN 50575:
Defines the provisions relating to the regulatory application of the CPR to cables (compliance certification procedures, Declaration of Performance, CE marking, etc.).

These standards gave rise to the implementation of "Euroclasses" to simplify and harmonize the product assessment and selection criteria according to CPR requirements applied to cables in construction.

C. Market control with traceability

The role of the CPR is to check compliance with the new frameworks put in place within European Union member countries. To do so, it provides several control methods:

- **The obligation for CE marking** on all construction products included in the CPR.
- **The obligation for the manufacturer to issue a Declaration of Performance (DoP)** for all products included in the CPR.

In order to better fight for prevention and fire safety, at European level, the CPR summarizes:

The harmonization of fire performance assessment methods

Product control and traceability.

A universal language

APPLICATION OF THE CPR TO CABLES

Application of the CPR to energy, control and communication cables is governed by different performance classification and fire reaction systems.

CPR implementation is based on:

A. Euroclasses

The new classification system, called Euroclasses, includes 7 classes based on the thermal potential of products. They determine the fire reaction performance levels in relation to the potential contribution to a fire.

Based on the Euroclasses, an Eca classified cable contributes 5 to 10 times more to the development of a fire than a Cca classified cable.

B. Additional safety criteria

The additional safety criteria supplement the Euroclasses classifying products in relation to their dangerous substance emissions:

Additional criteria		
Criteria	**Level**	**Description**
Smoke	**S1**	Smoke opacity Low obscuration, general visibility through the smoke Light (transmission >60%) s1a: transmission >80% s1b: transmission >60% and <80%
	S2	Medium to high obscuration
	S3	No recommendation
Droplets, Burning debris	**d0**	No droplet/burning particle appears within 1,200s
	d1	No droplet/burning particle lasting longer then 10s appears within 1,200s
	d2	Products for which no performance is declared or which do not meet criteria d0 or d1
Combustion gas acidity	**a1**	Emission of slightly acidic and non-corrosive gas and smoke
	a2	Emission of slightly acidic but corrosive gas and smoke
	a3	Emission of acidic and corrosive gas and smoke

C. The compliance certification system

To improve control and traceability, the CPR uses a compliance certification system called AVCP (Assessment and Verification of Constancy of Performance), the different systems of which are presented below:

Compliance certification system	1+	3	4
Factory Production Control (FPC)	M*	M	M
Tests on additional samples taken by the manufacturer	M		
Performance assessment	B**	B	M
Performance inspection	B		
Initial inspection (factory and FPC)	B		
Monitoring, assessment and constant appraisal of the FPC	B		
Test-audit on samples taken by the notified body before marketing	B		

*M= Manufacturer- **B= Notified body

Summary of the performance and fire reaction classification system for cables according to the CPR.

CPR classification			
Euroclasses	**Classification criteria**	**Additional criteria**	**Compliance certification system**
Aca	EN ISO 1716 gross calorific value		"1+" including: -initial type tests and continuous monitoring by a certified body - production control by the manufacturer
B1ca B2ca Cca Dca	EN 50399 Heat emission, flame propagation EN 60332-1-2 Flame propagation	Smoke: s1a, s1b, s2,s3 EN50399/EN61034-2 Droplets: d0,d1,d2 EN50399 Acidity: a1,a2,a3 EN60754-2	
Eca	EN 60332-1-2 Flame propagation		"3" including: - initial type tests by a certified laboratory - production control by the manufacturer
Fca	Flame propagation not compliant with Eca		"4": production control type tests by the manufacturer (self-certification)

D. CE marking

It indicates compliance with the applicable regulation – it is the "passport" to the European market; it must be on the cable from when it is marketed to its installation.

Within the CPR framework, CE marking includes:

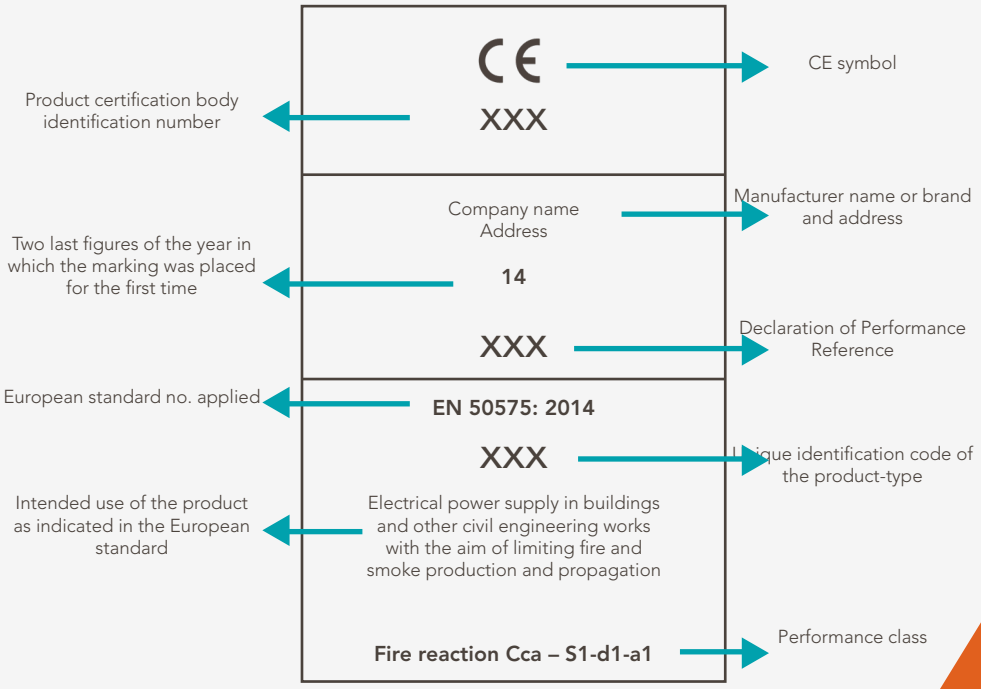
The CE symbol

Different information relating to the manufacturer

Different information relating to the product

hEN 50575 standard requires that all this information be placed on the packaging labelling.

CE marking example



Example for a cable subject to the compliance certification system 1+

E. The declaration of performance (DoP)

The DoP is one of the documents that enables traceability and control of the cable market within the European Union.

This document clearly identifies the product and its performance (with respect to the CPR) and indicates the manufacturer's liability.

A certain amount of information is therefore contained in the DoP in order to ensure the product's traceability and compliance on the market:

The product reference

Manufacturer or agent's name and address

Product description

The assessment system (Compliance certification system 1+, 3 or 4)

Identification of the notified body

The reference to harmonized standards or other specifications used

"Euroclass" fire reaction class

Signatory's identification

The consequences of CE marking and the DoP:

The national product safety monitoring authorities (customs, DGCCRF) may require that the Declaration of Performance be produced, in order to check the validity of the marking.

At this inspection, the national authorities have the jurisdiction to penalize missing CE marking, or false marking, with administrative and/or criminal sanctions.

Cable manufacturers must observe the various control and traceability requirements, and agents and cable importers and distributors are also required to comply with different procedures in order to sell their products on the European market.

THE INDUSTRY'S **RESPONSE**

SYCABEL (Syndicat Professionnel des Fabricants de Fils Câbles Electriques et de Communication de France), the French cable union, which studies, protects and develops the general interests of the cable industry in France, has compiled the industry's response to the new construction products regulation applied to cables (energy and telecommunications) in a recommendation guide.

A. Choosing your cable

Fire performance	Euroclasses	Energy cables	Communication cables
Optimal	B2ca: s1a,d1,a1	K22 and K25	K26, K23, K24 and K209 SF/FTP, S/FTP, F/FTP, U/FTP • Fiber optic cables
Improved	Cca: s1,d1,a1	FRN1X1G1, FRN1X1X2 H07 Z-1U, H07Z1-R, H07 Z-1K H07ZZ-F	SYT SF/FTP, S/FTP, F/FTP, U/FTP, SF/UTP, F/UTP, U/UTP OF connection cable
Telecom basic	Dca:s2;d2,a2		SYT SF/FTP, S/FTP, F/FTP, U/FTP, SF/UTP, F/UTP, U/UTP Distribution OF cable with permanent extractability Distribution OF cable
Basic Energy	Eca	U 1000R2V, U1000 A R2V, H07VU, H07VR, H07VK H07RN-F	

B. Recommendations according to the scope of application

Cables are chosen according to the building type and the risks that it represents. It is the project owner and the project manager's responsibility to assess the level of safety.

Depending on the field of application, the cable classification and Euroclasses may vary. Energy, control and communication cables (including fiber-optic cables) may be installed inside construction works as follows:

Hazardous premises

High-rises

Residential building

Railway Tunnels

Road Tunnels

PABs &
Special PABs

Performance au feu :

Optimal: B2ca- s1a,d1,a1

Improved: Cca-s1,d1,a1

Basic: Dca-s2,d2,a2

Basic: Eca

Example for PABs (Public Access Buildings)

1ère catégorie > 1,500 PERS

2ème catégorie > 700 and < 1,500 PERS

3ème catégorie > 300 and < 700 PERS

4ème catégorie < 300 PERS

5ème catégorie Establishment referred to in article R123-14 of the French construction code which does not reach the specific threshold

According to the buildings or construction works, SYCABEL recommends the Euroclasses			
Optimal B2ca-s1a,d1,a1	Improved Cca-s1,d1,a1	Basic Dca-s2,d2,a2	Basic Eca

Euroclasses in PABs (Public Access Buildings)		Energy cable					Communication cable				
		Category					Category				
Type	Type of operation	1	2	3	4	5	1	2	3	4	5
J	Elderly and disabled people's home										
L	Concert hall, conference room, meeting room, theater, projection room, multi-purpose room										
M	Store, shopping mall										
N	Restaurant, bar										
O	Hotel, family guesthouse										
P	Games hall, dance club										
R	Creche, kindergarten, daycare center. Other teaching establishment										
S	Library, documentation center										
T	Gallery										
U	healthcare facility care center, -100 nights, -20 beds										
V	Place of worship										
W	Administration, offices, banks										
X	Indoor sports center										
Y	Museum										

Except for fiber-optic cables with permanent extractability, for which the recommended euroclass is Dca: s2, d2, a2

CONCLUSION

As fire safety is everyone's business, we make every effort to offer the best products in order to meet both our own requirements and those imposed by our clients and the different European regulations.

With our recognized expertise in fiber-optic infrastructure, we know how to advise you based on your needs and throughout the different stages of building your network. FOLAN offers you the best combination of products in order to meet your expectations.