



# CPR Construction Products Regulation



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# Construction Products Regulation (CPR)

The European Union, with the aim of improving the safety of buildings, has created a construction products classification system in agreement with their fire behaviour, which is common for the whole of Europe within the Construction Products Regulation (CPR).

Belcom, early on, fully took on board the concern to protect against fire together with the more responsible participants in our industry and it is with a great deal of satisfaction that we can state that to comply with the new Euro classifications we have not had to alter any of our existing cable fire performance materials to achieve CPR compliance. What we have achieved by CPR testing is confirmation of the standards that we already met.

CPR, with its new product classification system and the quality control requirements entailed by this classification, represents an important step towards confirming the performance of cables and their fire safety level. These are standards which Belcom have always achieved but are now happy to confirm with third party test facilities.



## What is the Construction Products Regulation (CPR)?

The Construction Products Regulation\* CPR, is the European legislation that establishes the basic requirements and essential harmonised characteristics that all products designed to be permanently installed in construction works must satisfy within the EU.

Due to its legal nature, all relevant bodies such as cable manufacturers, distributors and re-sellers must comply with.

\*(EU) Regulation no. 305/2011, 9 March 2011 (published on 4 April 2011 in the Official Journal of the European Union) establishing harmonised conditions for marketing construction products, and abolishing EEC Directive 89/106 of the Council.

## What is the objective of the CPR?

The CPR regulation introduces new classification criteria and common classes, the so-called Euroclasses, for the entire European zone, creating a common language and a classification, assessment and certification system for all member countries, for construction products. With regards to fire behaviour, it permits establishing common standards to carry out assessment comparisons in equivalent conditions across the EU zone.

## Who does the application of the CPR affect?

The companies involved in the application of the CPR are the manufacturers, the distributors, the installers and engineering companies, as well as the competent Authorities of the EU member states.

Manufacturers and distributors are obliged to manufacture and market the products in agreement with the standards indicated in the CPR. Furthermore, manufacturers must make a "Declaration of Performance" (DoP), ratifying that the product meets the performance set by the CPR standards for the chosen Euroclass. Products must be identified with marks and tags that show their classification. Crucially, these properties and compliance with them must be validated by an independent body, the so-called Notified Bodies and their laboratories.

The competent authorities of each member state are responsible for determining the conditions that the materials of each national territory must satisfy, these may be different levels for different nation states. Installers, engineering companies and end users are obliged to select the appropriate products in agreement with the nation state, and they must satisfy the requirements established by the national authorities. Where appropriate, importers must also adopt all the necessary measures to ensure that the products they place on the market are in agreement with CPR requirements and with the mandatory national requirements.



## Why are cables affected by the CPR?

CPR Regulation defines as construction product all those products designed to be permanently incorporated into construction works. Power, telecommunications, data and control cables are included. Cables designed for connecting appliances or for internal wiring of equipment or electrical appliances, and all those cables that are not used as cables for construction are excluded.

All construction products placed in the EU market place prior to 1st July 2017 are deemed exempt from CPR. Notwithstanding those products may still have national standard requirements for example fire performance standards IEC 60332-1, IEC 60332-3, IEC 61034, IEC 60754.

## What characteristics must the cables satisfy with respect to the CPR?

CPR establishes the characteristics that construction materials must satisfy with respect to fire. Therefore, cables are only affected by the safety specifications in the case of fire (resistance and reaction to fire) and hazardous substances (emission and content). The other technical characteristics are defined in the regular standards.

The fire reaction of a cable has three relevant aspects: firstly, the contribution to fire propagation by the heat given off in the actual combustion of the cable and by the burning particles given off; secondly, the amount and transparency of the smoke emitted; and finally, the acidity of the gases given off.

We can define fire resistance as the capacity of a cable to maintain the electrical service of an installation during a fire. The greater fire resistance of a cable, the easier it will be to keep the emergency services in operation and therefore, permit evacuation. The standard that will develop this aspect is still in its draft phase.

Finally, the declaration of hazardous substances, their emission and content, indicates which components and in what proportion they are emitted in normal conditions of use, not of fire, by the cables, in order to preserve the environment. The fact that the content of hazardous substances has been taken into account will be indicated in the DoP of each product, although no criteria have yet been defined to determine them.

So for cable at present the most relevant aspect is reaction to fire. Fire resistance is still a pending regulation yet to be released.



## When must CPR be applied to cables?

1 July 2017.

All cables produced from 1st July 2017 must be compliant with CPR. All cables received into stock by Belcom prior to this date are exempt in as much as a 'DoP' is not required as these cables fall outside of the scope of CPR.

Belcom's rigorous adherence to fire performance international standards should be relied on in these instances. Whilst technically such products maybe exempt form CPR it is still the responsibility of all relevant parties to ensure validity of fire performance characteristics

## What are the Euroclasses of CPR that apply to cables?

The European Union has created a single and uniform classification criterion in the whole of Europe (a common language) to define the fire reaction performance of cables. Hence, some classes have been defined\*, using classification criteria in agreement the amount of heat emitted in presence of fire.

Likewise, it contemplates that the manufacturer, lacking requirements related to fire reaction, can use the "Undetermined performance" option (Euroclass F).

\*(EU) Delegated Regulation 2016/364, of 1 July 2015, on the classification of fire reaction properties of construction products.



No reaction



Very low reaction Non flame propagation. Non fire propagation (1.75m)  
Very low heat emission



Low reaction Non-flame propagation. Non-fire propagation (1.5m)  
Low heat emission



Reduced reaction Non-flame propagation. Non-fire propagation (2m)  
Reduced heat emission



Improved reaction Non-flame propagation  
Improved heat emission



Basic reaction Non-flame propagation

F<sub>ca</sub>

Undetermined



## What does Euroclass initially mean?

The designation of the fire reaction characteristics of electrical cables is based on a code that indicates their performance. This code specifies the Euroclass and, if applicable, additional classifications.



Class; satisfies the non propagation of the flame or of the fire, and emitted heat limits



Flammable particles; no burning droplets or particles that persist for more than 10 s during the 1200 s of the test



Reduced smoke emission and transmittance of over 60%



Reduced acidity and corrosiveness of the emitted gases (conductivity < 2.5 µS/mm and pH > 4.3)

### Digit 1

Fire propagation and heat emission performance, cable class (Aca, B1ca, B2ca, Cca, Dca, Eca, Fca).

Aca ..... They do not contribute to the fire.

B1ca - B2ca ..... Minimum contribution to the fire.

Cca - Dca - Eca ..... Combustible, they contribute the fire, from lower to higher contribution.

Fca ..... Undetermined contribution properties.

### Digit 3

Burning droplets/particles (d0, d1, d2).

This classification provides information about the dripping of burning material during the fire (d: droplet).

d0 .... No burning droplets or particles.

d1 .... No burning droplets or particles that last more than 10 seconds.

d2 .... None of the above.

### Digit 2

Smoke emission properties (s1, s1a, s1b, s2, s3).

This classification provides information about the opacity of the emitted smoke (s: smoke).

s1 ..... Little smoke production and slow smoke propagation.

s1a ..... Transmittance >80%.

s1b ..... Transmittance >60% and <80%.

s2 ..... Average smoke production and propagation.

s3 ..... None of the above.

### Digit 4

Acidity performance (a1, a2, a3) in addition applying the test described in standard UNE-EN 50267-2-3.

This classification provides information about the emission of acid gases during the fire (a: acidity).

a1 .... Conductivity < 2.5 µS/mm and pH > 4.3.

a2 .... Conductivity < 10 µS/mm and pH > 4.3.

a3 .... None of the above.

The performance code (fire reaction class and additional classification) according to CPR must appear in the cable marking together with the rest of the marks. This classification system ranks equally in all European Union countries.



## Euroclass classification

	Classes	EN ISO 1716 Calorific value	EN 50399 Heat emission and Fire growth rate	EN 50399 Non-fire propagation	EN 60332-1-2 Non-flame propagation	EN 50399 Smoke production	EN 61034 Smoke transmittance	EN 50399 Burning droplets and particles	EN 60754-2 Acidity
I Contribution to the development of fire	A <sub>ca</sub>	█				(S)	(S)	(d)	(a)
	B1 <sub>ca</sub>		█	█	█				
	B2 <sub>ca</sub>		█	█	█	s1	s1a	d0	a1
	C <sub>ca</sub>		█	█	█	s2	s1b	d1	a2
	D <sub>ca</sub>		█		█	s3		d2	a3
	E <sub>ca</sub>				█				
	+	F <sub>ca</sub>				█			

### Example



Class E<sub>ca</sub> It satisfies the non-flame propagation test, without additional classifications.



Classification a1 Reduced acidity and corrosiveness of emitted gases with conductivity < 2.5 μS/mm and pH > 4.3

Classification d1 No burning droplets/particles that persist for more than 10 seconds.

Classification s1b Reduced emission of smoke and transmittance of over 60% and less than 80%.

Class C<sub>ca</sub> It satisfies the non-flame propagation test, with the requirement of non-fire propagation and with emitted heat limits for this class.



## How are cables assessed and verified externally?

The harmonised standard requirements vary depending on the fire reaction class declared, so there are different **Assessment and Verification of Constancy of Performance (AVCP)** systems according to the enclosed table, which are more demanding for the upper Euroclasses. These systems are based on the participation of entities not associated with the manufacturer which, according to the name of CPR, will be the Notified Body and the Notified Laboratory.

All the assessment and verification of constancy of performance systems require the manufacturer to carry out internal quality controls as well as to prepare the Declaration of Performance (DoP) for each product. There are three assessment and verification of constancy of performance systems:

1+	3	4
<p>This is the maximum requirement level and corresponds to Euroclasses Aca, B1ca, B2ca and Cca. A Notified Body must inspect and be responsible for the surveillance, assessment and control of the production, as well as control the execution of initial sample and monitoring tests by the Notified Laboratory. The frequency of the monitoring tests is the highest.</p>	<p>This level correspond to Euroclasses Dca and Eca. The manufacturer must perform initial verification and monitoring tests on the products with a Notified Laboratory, but the participation of a Notified Body is not compulsory.</p>	<p>This level corresponds to Euroclass Fca. For the manufacturer, only the preparation of the Declaration of Performance is mandatory, and it corresponds, therefore, to the lowest requirement level.</p>

Consequently, depending on the fire reaction class declared, there are different assessment and verification of constancy of performance systems, which are summed up in the following table:

### Applicable Euroclass

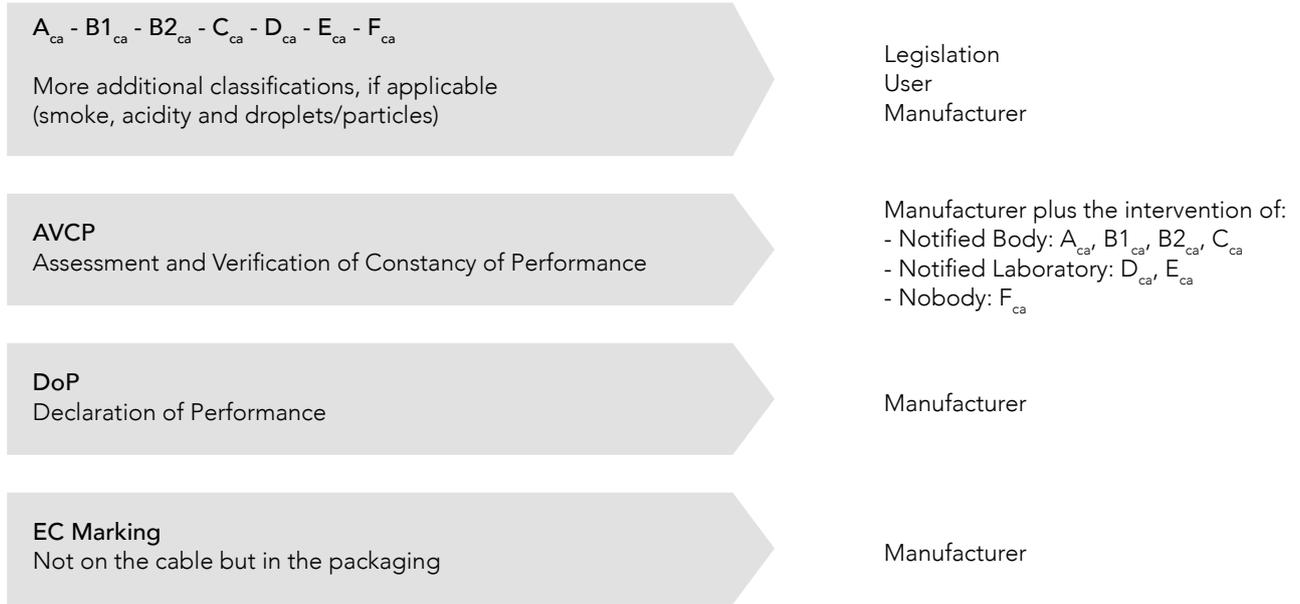


Verification elements	1+	3	4
Assessment and verification of constancy of performance systems			
Factory production control	M	M	M
Additional tests on samples taken from factory, in agreement with the determined test plan	M	-	-
Determination and test of the standard product by tests, calculation or tabulated values	NB	NL	M
Initial factory inspection and factory production control	NB	-	-
Factory monitoring inspection and factory production control	NB	-	-
Tests on samples taken before the product is launched onto the market	NB	-	-

NB Notified Body | NL Notified Laboratory | M Manufacturer



## Application scheme of CPR



## What is the declaration of performance "DoP"?

The manufacturer must prepare a Declaration of Performance (DoP). **The declaration of performance is a legal document that must be placed at the disposal of the public**, in which the manufacturer identifies the product and its programmed use, indicating the performance of the cable respect to its essential characteristics, which are currently, safety in case of fire (fire reaction according to UNE-EN 50575) and the emission of hazardous substances, although this is not assessed as currently there is no harmonised technical specification.

- A DoP will correspond to each marketed product, with an alphanumeric identification.
- **These declarations of performance will be detailed on each drum and delivered unless they are CPR exempt**



## What does the EC marking look like?

The EC marking symbol must be fixed in a visible, legible and indelible manner on the packaging used to market the cables, and it must be accompanied by additional information that is indicated in the harmonised standard. **It is not compulsory for the marking to appear on the cable.**



Example of tagging with EC marking for a class Eca cable, is:

**SO No. 203141**  
**Line No. 1**  
**Part No.**  
**4401P2454**

**CE Marking**  
**832**

**QR code linking to the Declaration of Performance (DoP)**

**EN50575:2014+A1:2016**

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**17**  
**DoP No. CPR-1014**  
**Supply of communication in buildings and other civil engineering works with the objective of limiting the generation and spread of fire and smoke.**

**Reaction to Fire: Eca**                      **Dangerous Substances : None**

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## Which standards are applicable for CPR?

### UNE-EN 13501-6

Fire classification of construction products and building elements. Part 6: Classification using data obtained from reaction to fire tests on electric cables.

### UNE-EN 50575

Power, control and communication cables. Cables for general applications in construction works subject to reaction to fire requirements.

### UNE-CLC/TS 50576

Electric cables. Extended application of test results.

### UNE-EN 50399

Common test methods for cables under fire. Heat release and smoke production measurement on cables during flame spread test. Test apparatus, procedures, results.

### UNE-EN 60332-1-2

Test methods on electric and optical fibre cables under fire conditions. Part 1-2: Test for vertical flame propagation for a single insulated wire or cable. Procedure for 1 kW premixed flame.

### UNE-EN 61034-2

Measurement of smoke density of electric cables burning under defined conditions. Part 2: Test procedure and requirements.

### UNE-EN 60754-2

Tests on gases evolved during combustion of materials from cables. Part 2: Determination of acidity (by pH measurement) and conductivity.

## Will CPR be applied equally in Europe?

CPR has been created with criteria in the whole of Europe and therefore it should be applied equally in each country. Each Member State has the discretion to decide on which of the Euroclasses will be applied to a specific product in that country.

The measurement and assessment criteria will therefore be equal in each country but different Euroclasses may be established for the same product in different countries.

## Will CPR bring about important modification in cables?

Yes, as the assessment criteria of the CPR are more demanding than current criteria. The Euroclass must be marked on the sheath of the cable.

Companies who have taken shortcuts will be required to readjust the compounds and parameters or the products they supply to ensure compliance. Belcom have made no changes to their designs to comply.





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