

# CONSTRUCTION PRODUCTS REGULATION

## CPR - UE 305/11

*Guide about the changes in the  
electric cable sector*



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# INTRODUCTION

With the new CPR Regulation (Construction Products Regulation), construction products – including cables for fixed installations – can no longer be used in buildings or civil engineering projects in Europe, if not tested and certificated according to the new regulations. As replacement of the Construction Products Directive (CPD), published by the EC in 1989, the CPR came into force for non-cable products in July 2013. The applicability to electric cables became operative on June 10 2016, with the publication of the EN 50575 Standard in the list of Harmonized Standards in accordance with the same Regulation (Commission Communication published in the Official Gazette of the European Union 2016/C 209/03). To enable all subjects involved comply with the new regulations, a coexistence period is envisaged, ending on July 1 2017, during which producers and importers will be able to place on the market cables that either meet or do not meet the CPR Regulation. At the end of this period, the CE marking and the Declaration of Performance will be mandatory for all cables for constructions placed on the market, even if, at the time of writing, the role of each individual national authorities has not been defined and clarified.



**July 1  
2013**

**June 10  
2016**

**July 1  
2017**

**ENTRY INTO FORCE**

**DATE OF APPLICABILITY TO THE CABLES**

**AFTER JULY 1 2017:**

- Cables without CE marking will be used if:
- In applications different from buildings and civil engineering projects;
  - Outside the European Union (export).

## KEY CONCEPTS OF CPR

The CPR is a development from the CPD and in the same way aims to break down the technical barriers to trade with construction products within the Single European Market.

In order for this to become possible, the CPR makes use of four main elements:

- A system of harmonized technical specifications
- An agreed evaluation system agreed of the compliance for each product family
- A network of notified bodies
- The CE marking of products

The CPR harmonizes the methods of assessment and verification, the procedures for the declaration of performance and the system for compliance assessment of construction products, but not the national regulations regarding the use of these products in construction works.

The choice of the required values for a product for a particular intended use is left to the Member States; however, these values must be expressed in the form of the technical language used in the harmonized technical specifications.

## CE MARKING

CE marking allows products to be legally sold within the EU, although single countries regulations still apply. Through the CE marking the manufacturer indicates that a product is compliant with the declaration of performance (DoP) which may change depending on a particular harmonised technical specifications that the products refers to.



## VOLUNTARY MARKS



Voluntary marks are allowed provided they fulfill a different function from that of the CE marking and are not liable to cause confusion, or reduce the legibility of the CE marking, or its visibility. These marks might provide added value, by covering, for example, a feature not treated by the standard.

Voluntary marks may not be used to demonstrate compliance with the basic requirements certifying performance related to harmonized characteristics. Therefore, they cannot replace a CE marking that has the aim of attesting that a product has been lawfully placed on the market in compliance with the CPR.

## DECLARATION OF PERFORMANCE

The manufacturer, importer or distributor completing a DoP assumes legal responsibility for the compliance of the construction product and the declared performances.

A copy of the declaration of performance must be provided both in paper form and in electronic form and in accordance with Article 7.3 of the CPR it can also be made available on a web site in line with conditions laid down by the Commission through delegated acts.

## ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

The assessment and verification of constancy of performance systems (AVCP) define the degree of involvement of third party bodies in the assessment of product compliance according to the relevant technical specification.

For each product family, the AVCP system was agreed by the member States and the European Commission, on the basis of the product's implications in relation to health and safety and on the particular nature of the production process of the product itself.

To achieve this objective the CPR uses five main elements:

- Factory Production Control (FPC) on the basis of a permanent and documented internal control of the factory production, in compliance with the relevant harmonized technical specifications;
- Initial inspection of the production plant and of the FPC;
- Continuous surveillance, assessment and evaluation of the FPC;
- Determination of the product type on the basis of type testing, type calculation, tabulated values or descriptive documentation of the product;
- Tests of samples taken before placing the product on the market.

The AVCP systems and the level of involvement of Notified Bodies will be provided later in the document, in the details sections relating specifically to the electric cables.

# NOTIFIED BODIES

The notified bodies are the product certification bodies, the FPC certification and testing laboratories, considered competent to perform the specific tasks of assessment. These bodies are previously authorized by their respective Member States and, then notified to the European Commission and the other Member States. These bodies are identified as "notified bodies". The Notified Bodies are required to participate in the "Group of Notified Bodies" (GNB), with their European counterparts, to discuss the issues of practical implementation and to achieve an enforceable and behavioral approach coherent with the objectives.

When a harmonized technical specification becomes operative for a particular product, the producers who need to consult a Notified Body can choose among all those available in Europe, as long as they are notified for the harmonized technical specification requested and for tasks related to the appropriate assessment procedure.

With reference to the function of notified bodies involved in the AVCP process for construction products, the CPR distinguishes:

- 1) Product certification body: a notified governmental or non governmental body possessing the necessary competence and responsibility for carrying out a product certification in accordance with given procedural and management rules;
- 2) Factory production control certification body: a notified body, governmental or non governmental, possessing the necessary competence and responsibility to carry out a factory production control certification in accordance with given procedural and managerial rules;
- 3) Testing laboratory: a notified laboratory which measures, examines, tests, calibrates or otherwise determines the characteristics or performance of materials or construction products.

The notified bodies are required to demonstrate their competence for all third-party tasks inside the process of AVCP for which they have been notified.

## THE PRODUCER AND OTHER ECONOMIC OPERATORS

The producers, authorized representatives, etc. are required to be informed about the publication of harmonized technical specifications, the state of progress and the date of mandatory CE marking for its products. The manufacturer must be informed in regard to the essential characteristics whose performance shall compulsorily be declared in the country of destination in relation to the pre-decided destination of use for its product.

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Further important duties of the manufacturer are:

- To store the technical documentation for a period of 10 years after the construction product has been placed on the market;
- Keep a register of all non-compliance in products and inform Distributors of any product recalls;
- Ensure the identification and complete traceability of the product;
- Provide safety instructions and information in the language of the Member State where the product is marketed;
- Take immediate corrective measures if a product turns out not to be in compliance with the DoP;
- Ensure that the product maintains its compliance with the DoP even after movement and storage;
- Provide all relevant information on the product when the competent national authority requests it;
- Act promptly in the event of alteration of the declared performance of the product in series.



## IMPORTER AND DISTRIBUTOR

The CPR, more clearly than the CPD, makes importers and distributors liable, requiring them to demonstrate, on their own account, that the producer has undertaken all actions required.

The identifying data and contact details of the importer or distributor must appear on the product, the labelling or the associated documents.

Before placing a construction product on the market, distributors must ensure that the product, where required, bears the CE marking and is accompanied by the correct documentation, instructions and all other useful information for security.

Distributors must be able to prove that the manufacturer and the importer have respected the required compliance specifications.

The responsibility of the importers and the distributors are:

- Recalling a product from the market if they believe that it does not conform to the DoP;
- Transmitting all relevant documents on the occasion of each economic transaction;
- Ensuring that the product still meets the DoP after storage and distribution;
- Providing all relevant information about a product every time a request is made by a competent national authority;
- For a period of 10 years, providing to the market surveillance authority the contact details of the economic operator that provided the construction product and the economic operator who has supplied the product.

At least the last two points and possession of the DoP is also required to the agent.

When a distributor or importer places a product on the market under his own trademark or modifies a product in any way, it becomes subject to the same obligations as the producer.

## ELECTRIC CABLES IN THE CPR

The CPR prescribes 7 basic requirements for construction works:

- 1) Mechanical resistance and stability
- 2) Safety in case of fire
- 3) Hygiene, health and environment
- 4) Safety and accessibility in use
- 5) Protection against noise
- 6) Energy saving and heat retention
- 7) Sustainable use of natural resources

The European Commission, within the characteristics considered relevant to construction safety, has decided to consider, in relation to the cables, Reaction and Resistance to Fire, in recognition of the importance of their behavior and their role in the event of fire. The release of harmful substances is also among the performance criteria considered relevant for cables, but, at the time of writing, minimum performance levels in this field have not been established as the cables during their normal use do not release harmful substances.



# CLASSIFICATION CRITERIA AND AVCP

The harmonized standard of product EN 50575 for the cables and its testing standards define:

- 7 reaction to fire classes ("Euroclasses") [ $A_{ca}$ ,  $B1_{ca}$ ,  $B2_{ca}$ ,  $C_{ca}$ ,  $D_{ca}$ ,  $E_{ca}$ ,  $F_{ca}$ ]

The main classification criteria is based on the propagation of the flame and heat release. For the higher classes the following additional parameters are also applied:

- Acidity (a)
- Fumes opacity (s)
- Dripping of incandescent particles (d)

Fire resistant cables are excluded from the classification, as the rules for this range of products are still under development at the time of writing.

- 3 AVCP systems, depending on the Euroclasses
- System 1+, which provides the initial verification, the continuous monitoring of the product and verifications of the production control system;
- System 3, which only provides the initial verification of the product;
- System 4, which is based on a self-declaration made by the manufacturer.

Being part of a determined class and constancy of performance must be checked and certified by independent Notified Bodies.

EUROCLASS	AVCP SYSTEM	TASKS FOR THE MANUFACTURER	TASKS FOR THE NOTIFIED BODY
$A_{ca}$	1+	- Factory production control (FPC)	- Initial type test (ITT) - Initial inspection of manufacturing plant and FPC - Continuous surveillance FPC - Audit testing of samples before placing product on the market
$B1_{ca}$			
$B2_{ca}$			
$C_{ca}$			
$D_{ca}$	3	- Factory production control (FPC)	- Initial type test (ITT)
$E_{ca}$			

# DETAILS OF REFERENCE STANDARDS / TEST

## TEST FOR NON-SPREADING OF THE FLAME ON A SINGLE INSULATED CABLE IN COMPLIANCE WITH STANDARD EN 60332-1-2

The test method consists of applying a flame of a 1kW burner to a single length of cable, positioned vertically.

For the classification and passing of the test the area of the burnt zone is assessed: if it does not exceed 425mm the test is deemed to have been successfully passed, the cable obtains (at least)  $E_{ca}$  class and can pass on to further tests. Failure to pass EN 60332-1-2 results in an  $F_{ca}$  class, which however can be attributed also in a case where no test is carried out.

## BEHAVIOR DURING COMBUSTION OF A BUNDLE OF CABLES IN ACCORDANCE WITH STANDARD EN 50399

This is without doubt the main test for cable classification. Preparation involves a bundle of cables having a rated length of 3.5m, fixed vertically to a suitable scale in a chamber of rated dimensions 2m x 1m x h4, in compliance to the conditions of the standard.

After positioning and adjusting a tape burner at the base of the scale, so that it supplies 30kW (for class  $B1_{ca}$ ) or 20.5kW (for classes  $B2_{ca}$ ,  $C_{ca}$ ,  $D_{ca}$ ), an air flow is generated (from below upwards) to give a rated flow rate of 8000 l/min. The flow is channeled through an opening in the ceiling of the chamber and captured by a fume hood connected to the measuring section of the apparatus. The duration of the test is 20 minutes, during which the data compiled relates to:

- Speed of heat development (via consumption of oxygen)
- Speed of fumes production
- Production of drops or lit fragments and duration of their combustion
- Length of burnt zone

Test EN 50399 thus enables determining the following parameters, used for obtaining the main classification:

- FS = Length of the burnt zone (in meters)
- THR 1200s = total heat developed during the whole test (in MJ)
- HRR peak = maximum point of the heat power - time curve during the test (in kW)
- FIGRA = indicator of the speed of spreading of the fire (in W/s)

## **ADDITIONAL EVALUATION TEST EN50339**

### **FUMES OPACITY**

The relevant parameters used for obtaining the additional evaluations relative to the opacity of the fumes are:

- TSP1200s = total quantity of fumes produced during the test (in m<sup>2</sup>)
- SPR peak = maximum point of the fumes production - time curve during the test (in m<sup>2</sup>/s)

The results obtained enable attributing additional classes s1, s2, s3 (in the order of decreasing performance) according to what is delineated by the following definition:  
s1 = TSP1200s ≤ 50 m<sup>2</sup> and SPR peak ≤ 0.25 m<sup>2</sup>/s  
s2 = TSP1200s ≤ 400 m<sup>2</sup> and SPR Peak ≤ 1.5 m<sup>2</sup>/s  
s3 = It does not satisfy the requirements for s1 or s2, or the performance is not declared

Class s1 can be further subdivided into two sub-classes (s1a, s1b) after having carried out the test specified in standard EN 61034-2.

### **DRIPPING OF INCANDESCENT PARTICLES**

Visual inspection is used to verify the appearance or not of drops/incandescent fragments during the test time and if they have a post-combustion time of less or more than 10s.

The results obtained enable attributing additional classes d0, d1, d2 (in the order of decreasing performance) according to what is delineated by the following definition:

d0 = No drops or incandescent fragments are detected within 1200s of testing  
d1 = The combustion of any drops or incandescent fragments does not persist for more than 10s in the 1200s of testing  
d2 = it does not satisfy the requirements for d0 or d1, or the performance is not declared.

## MEASUREMENT OF THE OPACITY OF THE FUMES DURING COMBUSTION IN COMPLIANCE WITH STANDARD EN 61034-2

The test consists in subjecting a bundle of cables (prepared according to the conditions set down by the standard) to the flame generated by a combustible mixture situated below the cables.

The test takes place in a closed cubic room having a 3m side, provided with a lamp - detector system located at about 2m height and such that the light beam crosses the whole width of the chamber.

A bundle of cables is prepared according to the instructions set down in the standard and subject to a thermal attack of the flame generated by a combustible mixture positioned immediately below the cables.

The measured parameter is transmittance, i.e. taking 100 as the initial value in the absence of fumes, the percentage of light which reaches the detector.

The minimum transmittance value obtained discriminates between class s1a and s1b according to the below-reported definition:

s1a = the cable is classified s1 (test EN 50399) and the minimum transmittance is 80% (test EN 61034-2)

s1b = the cable is classified s1 (test EN 50399) and the minimum transmittance is comprised between 60% and 80% (test EN 61034-2)



## MEASURING THE ACIDITY OF THE COMBUSTION GASES IN COMPLIANCE WITH STANDARD EN 60754-2

The standard determines the acidity (or in a broader sense the corrosivity) of the gases resulting from the combustion of the cables. The test includes the samples of constituents of the cable (about 1g of material) being subjected to pyrolysis at a rated temperature of 900°C. The combustion effluents are then collected in a watery solution, and two parameters of this are measured:

- pH
- Conductivity

The results obtained enable attributing additional classes a1, a2, a3 (in decreasing order of performance) according to what is outlined in the following definition:

a1 = conductivity < 2.5 µS/mm and pH > 4.3

a2 = conductivity < 10 µS/mm and pH > 4.3

a3 = does not satisfy requirements for a1 or a2, or the performance is not declared.



## SUMMARY TABLE

EUROCLASS	CLASSIFICATION CRITERIA	ADDITIONAL CRITERIA
A <sub>ca</sub>	EN ISO 1716	/
B1 <sub>ca</sub>		Smoke production (s1a, s1b, s2, s3) EN 50399/EN 61034-2
B2 <sub>ca</sub>	EN 50399	Acidity (a1, a2, a3) EN 60754-2
C <sub>ca</sub>	EN 60332-1-2	Flaming droplets (d0, d1, d2) EN 50399
D <sub>ca</sub>		
E <sub>ca</sub>	EN 60332-1-2	/
F <sub>ca</sub>	EN 60332-1-2	/

## GENERAL TREND

FIRE RISK	CABLE CLASSIFICATION
VERY HIGH	B2 <sub>ca</sub> - s1, d1, a1
HIGH	C <sub>ca</sub> - s1, d1, a1
MEDIUM	D <sub>ca</sub> - s3, d1, a3
LOW	E <sub>ca</sub>

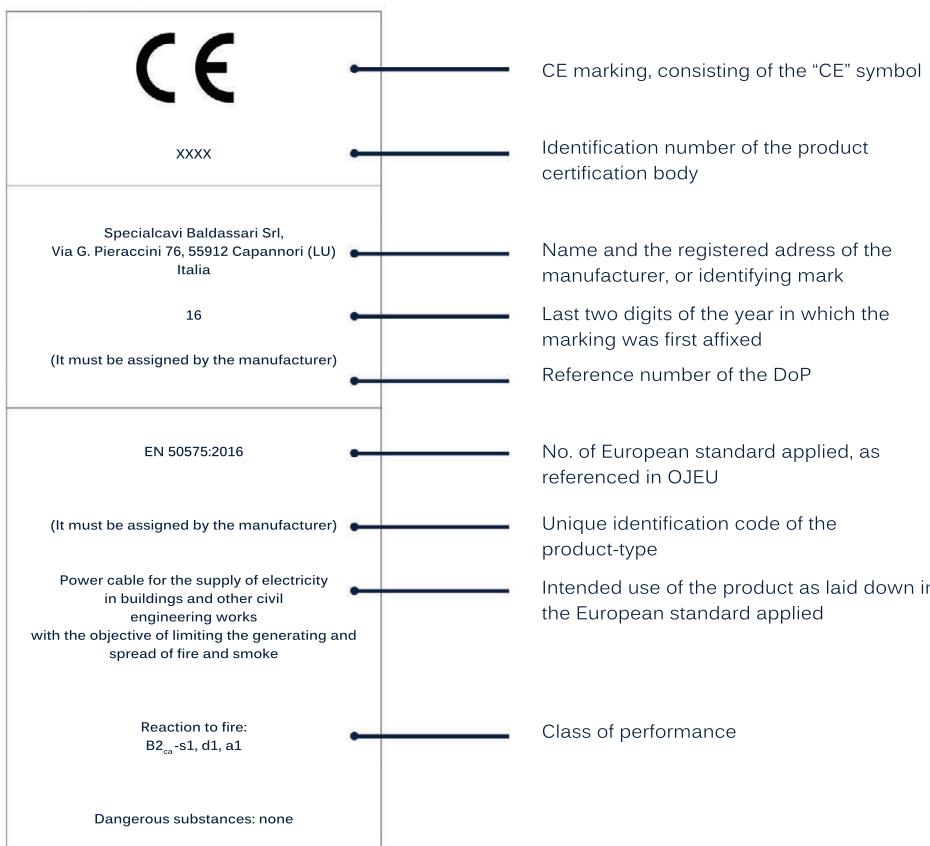
# CE MARKING

The CE marking for the CPR Regulation (article 9) must be positioned flanked to the information set down in the Regulation itself (e.g. identification no. of the DoP, name and address of the legal headquarters of the manufacturer, etc.).

In a case where it has not been physically

possible to satisfy the above requirements directly on the product, the CE marking shall be stated on the label (affixed on reels, hanks or other types of cable packaging) in a visible, legible and indelible manner.

An example of a label is provided below.

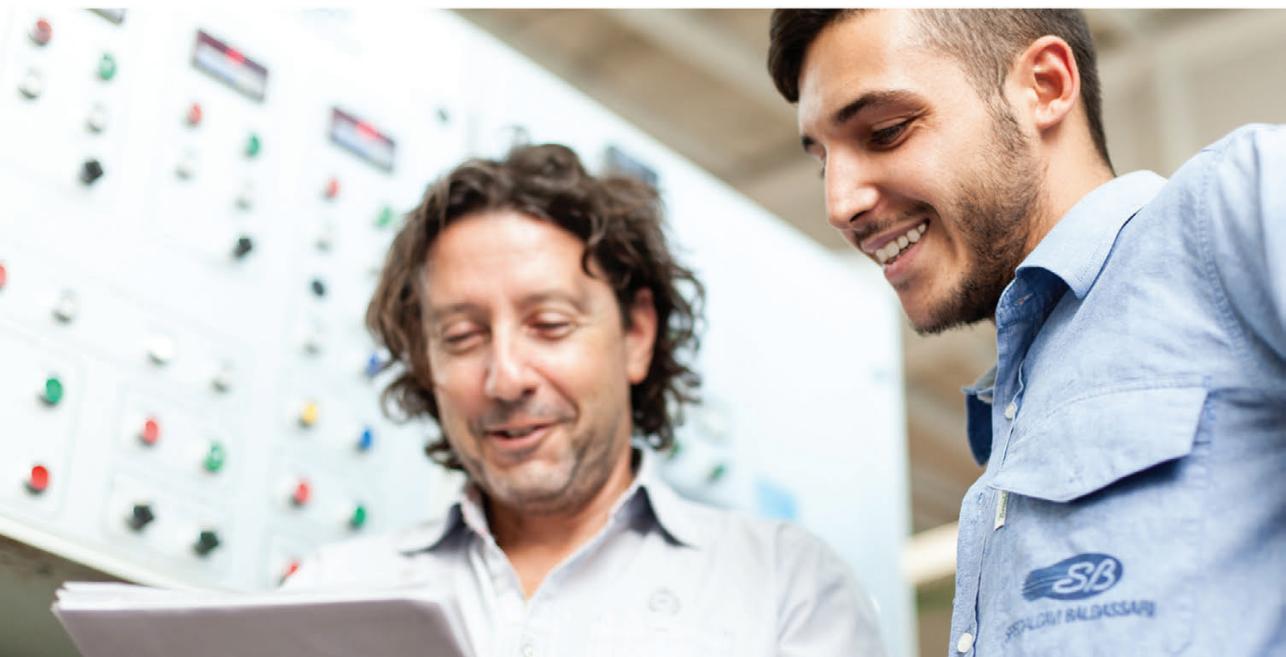


Example of CE computer marking on the label, for products subject to AVCP system 1+

## SPECIALCAVI BALDASSARI & CPR

**Specialcavi Baldassari** is making significant investments to ensure that the products that are included in the CPR Regulation application areas are compliant with the new regulations. Its cross-functional team of research and development, production and quality is at the disposal of all its clients to help in the understanding of the CPR and adapting to the Regulations.

Specialcavi Baldassari will constantly follow the latest news, developments and information that will arise in the course of time in relation to CPR.





## learn more about CPR

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