



White Paper

**Construction Products Regulation
& Fire Safety for Cables**



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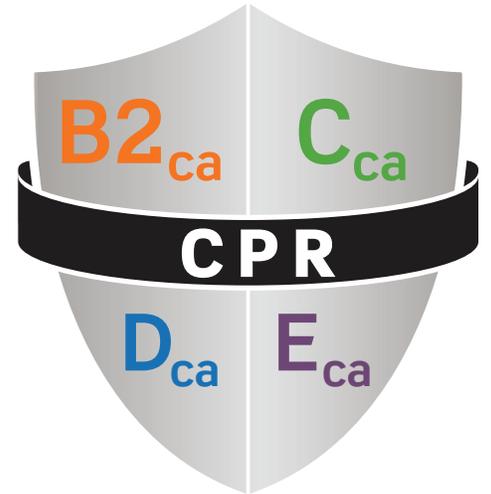
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Saving Lives and Protecting Buildings



At Leviton, we specialise in developing high-end world-class cabling and connectivity backed by unbeatable service and support. To better help our customers, we've put together a guide to new legislation from the EU. This white paper looks at fire safety standards for cabling within Construction Products Regulation (CPR) EU No 305/2011, implemented 1 July 2017.

What is CPR?

Construction Products Regulation (CPR) covers the marking of construction products within the European Union. With CPR, industry professionals, public authorities, and consumers have access to reliable information about a product's specification and they can compare products from different manufacturers.

Construction products and building materials have to be CE marked in accordance with the essential requirements specified in the CPR. The CE mark shows that a construction product is fit for purpose and uses a common technical language to assess the performance of construction products. It is recognised throughout the European Economic Area (EEA) and represents a harmonised approach to setting and enforcing standards.



CE marked construction products meet seven basic requirements. For power, control, and communication cables, **safety in the case of fire** and **sustainable use of natural resources** are the two most important requirements.

7 BASIC REQUIREMENTS OF CPR

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 economy and heat retention

7 - Sustainable use of natural resources

CPR creates a common technical language that helps assess the smoke and fire related performance of construction products. All fixed (permanent) cabling products placed on the market after 1st July 2017 must bear the CE mark for these essential fire safety performance characteristics

Members of the EEA are legally obligated to ensure building components — those construction products when properly installed, maintained, and used for their intended purpose — allow finished construction to comply with these essential requirements.

CPR replaces the Construction Products Directive (CPD), which allowed Member States and public and private sector procurers to set their own product performance requirements. While the CPD established consistent testing and declaration methods, the value for intended use was left to the regulators in each Member State. CPD was repealed and replaced by CPR in 2011.

The Purpose Behind CPR

CPR creates a straightforward means to buy and sell construction products used in building and civil engineering projects. Trade within the EU has traditionally come up against a number of technical barriers, as each country has its own national standards and testing protocols. CPR offers a solution with a streamlined set of standards developed in consultation within the 28 members of the European Economic Area (EEA), who have signed up to implement the regulation.

Current building construction projects often require many kilometres of installed cabling. High volumes of cabling have been recognised as fire and smoke safety risks, as they are one of the main methods that fire can rapidly spread through a building. Correctly controlling and regulating installed cabling can potentially save lives and minimise building damage in the event of a fire.

CPR for cabling was introduced on 10th June 2016, when the Harmonized Standard EN50575 was published in the Official Journal of the European Union (OJEU) and allowed for a 12-month co-existence period to allow CPR cabling to be phased in. The new EU regulations became **compulsory on 1st July 2017**. Therefore, it is now mandatory that every power, data and telecommunication cable that is intended to be permanently installed in a construction works must carry a **CE marked label** and have a **Declaration of Performance (DoP)** drawn up and made available. Products that are not permanently installed and outdoor cabling are not affected.

Cabling is required to be labelled with the CE mark for fire performance, noted in the recently published safety standard EN 50575. This is backed by a series of supporting fire safety standards. Individual countries are implementing the desired level of fire performance for building construction.



For a step-by-step guide to CE marks, visit: <http://bit.ly/CEmarkguide>.

Fire Safety Standards

The following fire safety standards identify testing apparatus and procedures for testing cable construction materials. These tests evaluate cabling under various fire conditions and measure heat release, smoke and gas production, acidity, and conductivity.

EN 50575 is the main fire safety standard. It covers power, control, and communication cables for general applications in construction works subject to reaction to fire requirements. This European standard changes fire performance requirements for cabling being installed in buildings. The other relevant standards linked or referenced from EN 50575 include:

- **EN50576** covers extended application of test results for electric cables, electric cable systems, cable sheaths, flaw detection, high-voltage tests, insulated cables, and test equipment.
- **EN13501** is for fire classification of construction products and building elements. Part 6 of the classification dictates using test data from reaction-to-fire tests.
- **EN50399** standardises reaction-to-fire tests and common test methods for cables under fire conditions. Establishes heat release and smoke production measurement on cables during flame spread test, identifying test apparatus, procedures, and results.

What CPR Means for the Networking Industry

The CPR directly affects a number of different bodies and organisations within the EU. It involves manufacturers whose products need to meet stringent CPR requirements, as well as building designers, contractors, distributors, and installers who deal with construction products for building and civil engineering projects. Authorities within EU Member States are responsible for communicating and enforcing CPR on a national level.

The decision makers, such as building specifiers, owners and planners, are required to understand the impact of this regulation and how best to implement the regulation and the right level of fire safety. **Figure 1** lists the fire safety classification levels. These include A_{ca}, B1_{ca}, B2_{ca}, C_{ca}, D_{ca}, E_{ca}, and F_{ca}, along with additional criteria detailed in **Figure 2**.

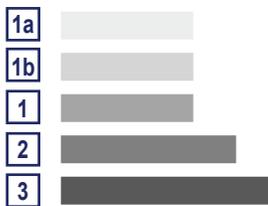
Figure 1 – Euroclasses and AVCP Systems

Euroclass (ca)	Classification Criteria	Additional Criteria	Assessment and Verification of Constancy of Performance System (AVCP)
A*	 EN ISO 1716 Fross heat of combustion		SYSTEM 1+ - Initial type-testing, factory inspection, and continuous surveillance of factory production control (FPC) with audit testing of samples by third-party notified product certification body SYSTEM 3 - Initial type-testing by third-party notified testing laboratory - FPC by manufacturer
B1*	 EN 50399 Heat release Flame spread	 Smoke production (s1a, s1b, s1, s2, s3) EN50399/ EN61034-2	
B2		 Acidity (a1, a2, a3) EN 50267-2-3	
C	 EN 60332-1-2 Flame propagation	 Flaming droplets (d0, d1, d2) EN 50399	
D			
E	 EN 60332-1-2 Flame propagation		
F*			SYSTEM 4 - Initial type-testing and FPC by manufacturer

*Classes A and B1 are not applicable to LSHF/LSZH data cables, and class F is not permitted, as it fails the fire regulations.

Figure 2 – Additional Classifications

SMOKE PRODUCTION
EN 50399 / EN 61034-2



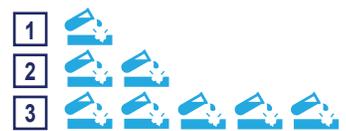
- s1: < / 50 m²
- s2: < / 400 m²
- s3: not meeting s2 or no performance
- a: >80% light transmittance
- b: >60% light transmittance

FLAMING DROPLETS
EN 50399



- d0: no droplets after 1200 s
- d1: no droplets persisting longer than 10 s within 1200 s
- d2: not meeting d1 or no performance

ACIDITY
EN 50399 / EN 60754-2



- a1: conductivity <2.5 μSmm⁻¹, pH > 4.3
- a2: conductivity <105 μSmm⁻¹, pH > 4.3
- a3: not meeting a2 or no performance

There are two key elements when it comes to specifying a Euroclass level:

1. Legal: What is the minimum level that my local regulation requires by law?

Each one of the 28 countries who signed up to the Constructions Products Regulation are tasked with the implementation of it within their own national laws and regulations. Different Member States require different CPR classification levels for various applications. Each Member State may implement the standard in line with their regional requirements. For example, hospitals require a B2_{ca} rating in some countries, but only a C_{ca} rating in others. All Member States have a minimum classification, but this too can vary.¹

2. Voluntary: What level should I specify to keep the people who work in my building safe in the event of fire and how can I best protect my building?

When it comes to protecting the lives of the people who work and live in a building and protecting the building itself, then higher fire safety levels ("Euroclassification" levels) for cables should be considered.

The guideline in **Figure 3** below can be used to base any specification, unless it is overwritten by a higher standard within the local regulation. Always check your local regulations.

Figure 3 – Example Applications Requiring Higher Euroclass Cables

Application Area	Euroclassification	Building Fire Safety Requirements
Very High Risk Environments - Examples: Special-purpose constructions, tunnels, hospitals, nurseries, escape routes, airports, metro, train stations, buildings with high people density.	B2_{ca}-s1,d2*,a1	Very High
High Risk Environment - Examples: Commercial buildings, leisure facilities, hotels, schools, administration & office buildings.	C_{ca}-s1,d2*,a1	High

*For high and very high fire risks, recommendation to support adoption of d1 Source: Europacable Industry Group of Cablemakers

The latest industry guidelines will also show high levels of C_{ca} and B2_{ca} recommended for

- Buildings with high volume of occupants (e.g., public buildings, education centres, hospitals)
- Buildings that are difficult to evacuate quickly (e.g., tunnels, underground stations)
- Buildings and areas of buildings where some occupants have limited mobility (e.g., hospitals, nurseries)

Official testing and certification institutes known as Notified Bodies provide independent verification that products meet CPR standards.

Notified Bodies

Notified Bodies are the only recognised third party carrying out the assessment of performance of construction products. They are designated by EU countries, and the European Commission ensures cooperation between Notified Bodies.

- Notified Certification Bodies, are required to carry out duties in order to complete the certification of the Higher Euroclass cables within the Assessment and Verification of Constancy Performance (AVCP) 1+ system.²
- Notified Test Bodies are facilities that may carry out the testing and Classification of product. These are used within the AVCP System 3 and are used within the technical files submitted to the Notified Certification Body as part of the AVCP system 1+ certification.

The Higher Fire Safety Cables are 'self extinguishing', which are Euroclass C_{ca} to A_{ca} in **Figure 1**. These products are subject to the 1+ assessment system, with regular inspections and continuous surveillance of factory production control every six months. In addition, to ensure compliance, product samples are tested annually, with a formal test every three years by a third-party notified product certification body.

CPR — The Essential Documents

Individual products will have a CPR **Declaration of Performance (DoP)**. This is an official certificate identifying the notified certification body, the declared performance of the product tested, and the EuroClass the product meets. This helps increase transparency and improves the functioning of the Single Market. Leviton DoPs comply with the prescribed format for EN50575.

Declaration of Performance (DoP) Certificate

Brand-Rex | LEVITON company

DECLARATION OF PERFORMANCE

DoP No. 00029
Annex III Construction Product Regulation (EU) No 305/2011.

For the Construction product: Communication cables

1. Unique identification code of the product-type	AC6U Dca Cat 6A U/UTP Dca
2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4):	As per Product Label
3. Intended use or uses of the construction product	Supply of communications in buildings and other civil engineering works with the objective of limiting the generation and spread of fire and smoke.
4. Contact address of the manufacturer According to Article 11(5):	Brand-Rex Ltd, Viewfield Industrial Estate, Glenrothes Fife, KY6 2RS, Scotland, UK Tel: +441592772124 Fax: +441592775314 Email: support@brand-rex.com
5. Contact address of authorized representative: According to Article 12(2):	As per Item 4.
6. System of assessment and verification of constancy of performance of the construction product as set out in CPR EU No.305/2011 Annex V.	System 3
7. Notified product certification body Notified testing laboratory performed the determination of the product type on the basis of type testing (based on sampling carried out by the manufacturer), type calculation and tabulated values or descriptive documentation.	NB2652
8. Declared performance	

Essential characteristics	Performance	Harmonized technical standard
Reaction to fire	Dca-s2, d2, a1	En 50575:2014
Release of dangerous substances	None	

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8.

CE Marked Product Labelling

The Leviton product label on the right is an example of a Euroclass label. Much of this information is required by law, including the CE Mark, the Notified Body that tested the product, the DoP cross reference number, the classification for reaction to fire, and an environmental declaration. In addition, Leviton adds two more features to its labels to assist customers: a QR code and URL that link to the product's DoP.

- CE Mark (CPR Reaction to Fire)** points to the CE symbol.
- Notified Body - 3rd Party Test** points to NB2661.
- DoP Cross Reference** points to DoP No.0071_GF_PDC_LU-B_B2s1ad0a1_00.
- Classification** points to EN 50575:2014 Clause GF008PDC12LU-B2ca.
- Environmental Declaration** points to Reaction to Fire: B2ca-s1a,d0,a1 and Dangerous Substances: None.
- QR Code link to DoP on Web-site** points to the QR code.
- Web-site Links** points to the URL: https://www.brand-rex.com/CPR/0071_GF_PDC_LU-B_B2s1ad0a1_00.pdf.

CE Marked Product Labelling

Remember... CPR fire safety regulations for cabling became mandatory on July 1st, 2017. It is mandatory for all cables placed on the market after 1st July to have a CE mark and fire safety Euroclass level.

Additional Colour Coding

In order to support your compliance to CPR, Leviton has developed a colour coding scheme for its copper data cables. Installers will easily be able to determine which cables need to go in the appropriate locations. This is especially useful for installations where a mix of different EuroClasses is required, such as in fire escape routes or within ward areas of a hospital. This will also assist with any inspections that are carried out to verify compliance to National Regulations.

ORANGE



Very High Fire Protection
Self Extinguishing

- Specified for hospital ward areas and children's nurseries, above fire exits and escape routes in public buildings, airports, metro, train stations, buildings with high people density.

GREEN



High Fire Protection
Self Extinguishing

- Specified for hospital 'horizontal/main building areas' where people have more mobility, commercial buildings, leisure facilities, hotels, schools, administration and office buildings.

BLUE



Moderate Fire Protection
Limited Emissions

- Used as basic minimum for general installs in some regions.

VIOLET



Basic Fire Protection

- Used as basic minimum for general installs in some regions.

In addition, this colour coding of copper cables ensures that the intended CPR classification is effectively visible for the entire delivery chain, from manufacturer, to distributor, to installer, avoiding possible mistakes along the way.

Our goal is to ensure that you are compliant and that the EuroClassification is easily identifiable within an installation. We are committed to making the transition to CPR compliant products simpler for our customers and we believe that colour coding is just one way in which we can help you to do this. That said, should you have specific needs in your installation then other cable colours are available on request, we will continue to be flexible in supporting your needs.

Leviton and CPR

We all have responsibilities to ensure we are legal, compliant, informed and implementing CPR correctly:

- Building designers, contractors, and local building authorities need to ensure a product meets CPR specifications and is appropriately marked.
- Manufacturers are required to provide the necessary CPR testing evidence for their products.
- Distributors and installers are responsible for supplying and installing CE marked products accompanied by a copy of the DoP and, where applicable, safety data sheets highlighting instructions and safety information. These materials will be provided in a language determined by the Member State where the product is made available.

Leviton is one of 21 European cable manufacturers involved in developing CPR standards, and we can provide support and advice to specifiers, installers, and the supply chain.

For construction products to pass the rigorous CPR classification process, manufacturers and suppliers must invest significant resources and demonstrate clear controls in their design and manufacturing operations. An official EU Notified Body inspects our manufacturing factory every six months, ensuring processing controls are in place and that products are tested annually.

Leviton worked closely with industry advocate Europacable to offer a full range of CE marked products that comply with the new regulations. This required us to gain third-party certification and participate in an ongoing maintenance programme.

To learn more about CPR cabling, visit <http://www.Brand-Rex.com/CPR>.

Footnotes

1 Regional CPR Implementation:

For a current list of product contact points for construction (Regulation EU 305/2011, art.10), please visit the European Commission website at <http://ec.europa.eu/DocsRoom/documents/23161/attachments/1/translations/>

- 2 The Assessment and Verification of Constancy of Performance (AVCP)** is a harmonised system defining how to assess products and control the constancy of the assessment results. This system safeguards the reliability and accuracy of the Declaration of Performance. Five different systems are in place for construction products in the Construction Products Regulation. They range from large-scale third party involvement to self-declaration and monitoring by the manufacturer. The technical specifications EN50575:2014: A1(2016) includes the technical details for the implementation of the AVCP system for cable systems.

We invent and manufacture the industry's best cabling and connectivity. We build them to last. And we stand behind every product and end-to-end system — delivering the highest performance and unbeatable service and support — throughout the life of your network. Add the peace of mind that comes from working with a stable, century-old supplier, and you get the **highest return on infrastructure investment.**

NETWORK SOLUTIONS DIVISION HEADQUARTERS

2222 - 222nd Street S.E., Bothell, WA 98021 USA | leviton.com/ns

Inside Sales (800) 722 2082 insidesales@leviton.com
International Inside Sales +1 (425) 486 2222 intl@leviton.com
Technical Support (800) 824 3005 / +1 (425) 486 2222 appeng@leviton.com

EUROPEAN HEADQUARTERS

Viewfield Industrial Estate, Glenrothes, Fife KY6 2RS, UK | brand-rex.com
 Brand-Rex Limited is a subsidiary of Leviton Mfg. Co., Inc

Customer Service +44 (0) 1592 772124 customerserviceeu@leviton.com

MIDDLE EAST HEADQUARTERS

Bay Square, Building 3, Office 205, Business Bay, Dubai - UAE | leviton.com/ns/middleeast

Customer Service +971 (4) 886 4722 / +971 (4) 454 8644 lmeinfo@leviton.com

CORPORATE HEADQUARTERS

201 N. Service Road, Melville, NY 11747 USA | leviton.com

Customer Service (800) 323 8920 / +1 (631) 812 6000 customerservice@leviton.com

ADDITIONAL OFFICES

Africa +971 (4) 886 4722 lmeinfo@leviton.com
Asia / Pacific +1 (631) 812 6228 infoasean@leviton.com
Canada +1 (514) 954 1840 pcservice@leviton.com
Caribbean +1 (954) 593 1896 infocaribbean@leviton.com
China +852 2774 9876 infochina@leviton.com
Colombia +57 (1) 743 6045 infocolombia@leviton.com
Latin America & Mexico +52 (55) 5082 1040 lsamarketing@leviton.com
South Korea +82 (2) 3273 9963 infokorea@leviton.com

ALL OTHER INTERNATIONAL INQUIRIES international@leviton.com

