

CONSTRUCTION PRODUCTS REGULATION > MOLEX CES COPPER AND FIBRE CABLE

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WHITE PAPER

Molex Connected Enterprise Solutions

EXECUTIVE SUMMARY

Combustible construction materials can cause untold amounts of damage, resulting in loss of life as well as assets and income. As a result, fire safety has been and continues to be a major objective when designing a building. The growth of copper and fibre cabling infrastructures in buildings has been recognised as contributing to a greater fire risk with each new installation. Reducing the risk of fire propagation, smoke generation and toxic emissions from power, control and data communications cabling has now been incorporated into the EU Construction Products Regulation also known as EU Regulation 305/2011.

Construction Products Regulation (CPR)

The Construction Products Regulation (CPR) lays down harmonised rules for the marketing of construction products in the EU. The Regulation provides a common technical language to assess the performance of construction products. It ensures that reliable information is available to professionals, public authorities, and consumers, so they can compare the performance of products from different manufacturers in different countries. This is to ensure that materials used in “construction works” do not endanger the safety of people, property or the environment. Under this regulation, all construction products and building materials installed in the EU must contain the CE mark that provides proof of compliance. The CE mark does not indicate the quality of the product. It denotes that the product meets the safety criteria as specified for the product concerned.

“CPR lays down harmonised rules for the marketing of construction products..”

Construction Works - Definition

The carrying out of any building, civil engineering or engineering construction work such as bridges and tunnels. Construction works are not ships, trains, buses, cars, aeroplanes etc.

Benefits of the CPR:

- Free circulation of construction products in the EU’s Single Market
- National authorities can set performance requirements using the harmonised European standard or European Assessment Document
- Users of construction products can better define their performance demands
- Market surveillance can rely on one common information structure.

Communications Cabling and the CPR

All data and telecommunications cable, copper and fibre, supplied to the EU member states and permanently installed in construction works, is subject to the rules of CPR from 1st July 2017. The CPR affects communications cabling as it specifies its reaction to fire. The harmonised European Standard EN 50575:2014 is the reference standard of the CPR in relation to power, control and communications cables, reaction to fire requirements.

“All data and tele-communications cable... is subject to the rules of CPR.”

Communications Cabling - Reaction to Fire Classes

The EN 50575:2014 standard classifies the reaction to fire performance of cables based on:

- 1) Heat Release and Flame Spread
- 2) Smoke Production
- 3) Flaming Droplets
- 4) Acidity

The above classifications are specified in existing standards: IEC 60332-1 (Test for vertical flame propagation), IEC 61034-2 (Measurement of smoke density of cables burning under defined conditions), IEC 60754-2 (Test on gases evolved during combustion of materials from cables) and are now also included in a new harmonised standard EN 50399:2014+A:2016. The standard sets out:

- Requirements for reaction to fire
- Test methods for reaction to fire
- Factory production control
- Assessment and verification of consistency of performance (AVP)
- Defines a number of reaction to fire classes known as Euroclasses
- Marking, labelling and packaging

Euroclasses

From 1st July 2017 all data and telecommunications cable must be ranked in terms of its reaction to fire performance, by its Euroclass.

There are seven Euroclasses, for flame spread and heat release as shown below.

"All data and communications cable must be ranked..."

Euroclass	Reaction to Fire Standards	Classification
Aca	Gross heat of combustion EN ISO 1716	Class Aca is for non-combustible products, eg. cables with ceramic insulation. Out of scope for data cables.
B1ca	Heat Release EN 50399, Flame spread EN 50399, and EN 6033-1-2	Class B1ca is the best in class, ie. this cable is the least capable of spreading fire. Class B2a and Cca cable are capable of some degree of spreading a fire.
B2ca		
Cca		
Dca	Heat release EN 50399, Flame spread EN 50399, and EN 60332-1-2	Class Dca cable is difficult to ignite by a small flame. Heat release and flame spread are assessed.
Eca	Flame spread EN 60332-1-2	Class Eca is difficult to ignite by a small flame. Heat release and flame spread are not assessed.
Fca		Cable that has no determined performance

In addition to the flame spread and heat release rankings, additional performance criteria must be declared for smoke production (s), flaming droplets (d) and acidity (a) for cables with a Euroclass higher than Class Eca.

Euroclass	Reaction to Fire Standards	Additional Parameters		
		Smoke production	Flaming droplets	Acidity
Aca	Gross heat of combustion EN ISO 1716	None		
B1ca	Heat release EN 50399, Flame spread EN 50399, and EN 60332-1-2	s1a, s1b, s2, s3 EN 50399, EN 61034-2	d0, d1, d2 EN 50399, EN 60754-2	a1, a2, a3 EN 50399, EN 60754-2
B2ca				
Cca				
Dca	Heat release EN 50399, Flame spread EN 50399, and EN 60332-1-2			
Eca	Flame spread EN 60332-1-2	None		
Fca		None		

Smoke Production

- s1 Burns and produces smoke, but the cable has not been tested for the transmittance of the smoke.
- s1a Burns and produces smoke. Transmittance of smoke values percentages defined.
- s1b Burns and produces smoke. Transmittance of smoke values (less demanding than s1a)
- s2 Less demanding than s1, s1a, s1b
- s3 No performance declared or does not conform to s2 or s1 criteria

Flaming Droplets

- d0 No droplets
- d1 Some droplets
- d2 No performance declared or does not conform to d1 or d0 criteria

Acidity (Acid Gas Evolution)

- a1 The most demanding criteria
- a2 Less demanding criteria
- a3 No performance declared or does not conform to a1 or a2

The CPR implementation in EU

Each EU member state, will decide which Euroclass to implement for their specific national construction standards and regulations. This means that that not all EU states will necessarily adopt the same Euroclass.

Factory Production Control and Assessment and Verification of Consistency of Performance (AVP)

“Not all EU states will necessarily adopt the same Euroclass.”

All cable manufacturers who sell copper and fibre cable into the EU are required to test the performance of their cables (reaction to fire) via a Notified Body. A Notified Body is an independent organisation whose role is to evaluate whether the product complies with the relevant legislation in force. Each Notified Body is designated by the individual member state.

An Assessment and Verification of Constancy of Performance (AVCP) is completed by the Notified Body and a Certificate of Conformance is issued to the cable manufacturer on the successful completion of the relevant test. The 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.

Declaration of Performance (DoP)

Cable manufacturers must supply the buyer of their cables with a Declaration of Performance document and add a CE mark visibly, legibly and indelibly to the product labels supplied with the reels, coils or drums of the cables.

The DoP:-

- identifies the product
- states its intended use
- states its essential characteristics, as given by its declared performance (for cables by Euroclass)

CONCLUSION

Molex CES implementation of CPR Compliance

Molex CES is fully committed to compliance with the Construction Products Regulation. As a European provider of copper and fibre cabling infrastructures, we have invested in all the relevant tests and compliance processes for the cabling products in our product range. Molex CES is planning to receive Euroclass Eca cables before 1st July 2017 and is investing in the testing of some of the higher Euroclass cables as may be necessary to support our customers throughout the European Union.

The information contained in this document is based on our understanding of the Construction Products Regulation. It is not a legally binding document and shall in no way be construed or interpreted to give rise to any legal right or obligation whatsoever. Information contained herein is subject to change.