



CPR - The EU Construction Product Regulation



EU Regulation 305/2011: Construction Products Regulation (CPR)

Purpose: Regulating performance under fire of all construction products in the EU

Published: April 2011

The latest document: COMMISSION DELEGATED REGULATION (EU) 2016/364 date 1 July 2015

Mandatory in the EU since 1 July 2017

In simple words:

As of 1 July 2017, all construction products (including cables) are allowed to be sold in the EU only if they are classified according to the CPR and labeled accordingly.

The basic standard that defines the framework for cables is EN 50575:2014: “Power, control and communication cables - Cables for general applications in construction works subject to reaction to fire requirements”.

CPR cables Classification Standard and Systems

Class	Main Classification	Additional Performance	Assessment System and Notified Body
Aca	EN ISO 1716 Gross heat of combustion		System 1+ initial type testing and initial inspection audit (IIA) and continuous surveillance audit (CSA) of factory production control (FPC) by 3rd party notified body
B1ca	EN 50399 Heat release Flame spread	Smoke production (s1a, s1b, s2, s3) EN 50399/ EN 61034-2	
B2ca			
Cca			
Dca	EN 60332-1-2 Flame propagation	Acidity (a1 , a2, a3) EN 50267-2-3 Flaming droplets (d0, d1 , d2) EN 50399	System 3 initial type testing by 3rd party notified testing laboratory; FPC by manufacturer
Eca	EN 60332-1-2 Flame propagation		
Fca			System 4 Performance not determined

CPR cables Classification Details According to EN 13501-6:2014

Class	Test method	Classification criteria	Additional classification
B2ca	EN 50399	FS ≤ 1.5 m; and THR _{1200s} ≤ 15 MJ Peak HRR ≤ 30 kW FIGRA ≤ 150 W/s H ≤ 425 mm	Smoke production s Flaming droplets d Acidity (of smoke) a
	EN 60332-1		
Cca	EN 50399	FS ≤ 2.0 m THR _{1200s} ≤ 30 MJ Peak HRR ≤ 60 kW FIGRA ≤ 300 W/s H ≤ 425 mm	
	EN 60332-1		
Dca	EN 50399	FS > 2.0 m THR _{1200s} ≤ 70 MJ Peak HRR ≤ 400 kW FIGRA ≤ 1300 W/s H ≤ 425 mm	
	EN 60332-1		
Eca	EN 60332-1	H ≤ 425 mm	None
Fca	No performance determined		None

FS = **Fire Spread** during EN 50399 test.

THR_{1200s} = **Total Heat Release**: Integrated heat value during EN 50399 test duration (1200sec).

Peak HRR = Peak **Heat Release Rate** value during EN 50399 test.

FIGRA = **Fire Growth Rate** index. A complex calculation done according to EN 50399 Annex G.

H = Flame spread during EN 60332-1 flame test.

CPR data cables Classification According to EN 13501 Optional levels

After the tests made according to EN 50399 and EN 60332-1 are completed the cable can be classified.

The complete classification is done as shown on the right whereas:

The **s1 and s2** values are set based on TSP and Peak SPR limits specified in EN 13501, measured according to EN 50399. $s1 < s2$.

s3 indicates that smoke production was not tested.

Additional light transmission measured according to EN 61034-2:

s1a: Light transmission >80%

s1b: Light transmission Between 60% and 80%.

s1: Light transmission according to EN 61034-2 not tested

d= Droplets formation - limits specified in EN 13501, measured according to EN 50399:

d0: No flaming droplets/particles occur within the 1200 sec test.

d1: Flaming droplets/particles not persisting longer than 10 sec within the 1200 sec test.

d2: No performance is declared, or product does not comply with the d0 and d1 criteria.

a=Acidity level tested according to EN 50267-2-3 Conductivity and pH:

a1 and a2: Limits specified in EN 13501. $a1 < a2$.

a3: Conductivity and pH not tested or does not comply with a1 and a2.

TSP = Total Smoke Production (of light-obscuring smoke) in m^2

Peak SPR = Peak Smoke Production Rate in m^2/sec .

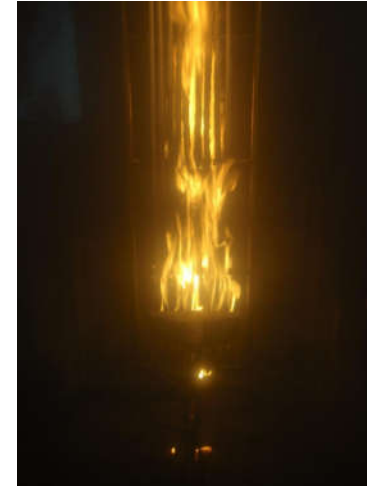
B2 _{ca} -s1a,d0,a1	B2 _{ca} -s1a,d1,a1	B2 _{ca} -s1a,d2,a1
B2 _{ca} -s1a,d0,a2	B2 _{ca} -s1a,d1,a2	B2 _{ca} -s1a,d2,a2
B2 _{ca} -s1a,d0,a3	B2 _{ca} -s1a,d1,a3	B2 _{ca} -s1a,d2,a3
B2 _{ca} -s1b,d0,a1	B2 _{ca} -s1b,d1,a1	B2 _{ca} -s1b,d2,a1
B2 _{ca} -s1b,d0,a2	B2 _{ca} -s1b,d1,a2	B2 _{ca} -s1b,d2,a2
B2 _{ca} -s1b,d0,a3	B2 _{ca} -s1b,d1,a3	B2 _{ca} -s1b,d2,a3
B2 _{ca} -s1,d0,a1	B2 _{ca} -s1,d1,a1	B2 _{ca} -s1,d2,a1
B2 _{ca} -s1,d0,a2	B2 _{ca} -s1,d1,a2	B2 _{ca} -s1,d2,a2
B2 _{ca} -s1,d0,a3	B2 _{ca} -s1,d1,a3	B2 _{ca} -s1,d2,a3
B2 _{ca} -s2,d0,a1	B2 _{ca} -s2,d1,a1	B2 _{ca} -s2,d2,a1
B2 _{ca} -s2,d0,a2	B2 _{ca} -s2,d1,a2	B2 _{ca} -s2,d2,a2
B2 _{ca} -s2,d0,a3	B2 _{ca} -s2,d1,a3	B2 _{ca} -s2,d2,a3
B2 _{ca} -s3,d0,a1	B2 _{ca} -s3,d1,a1	B2 _{ca} -s3,d2,a1
B2 _{ca} -s3d0,a2	B2 _{ca} -s3,d1,a2	B2 _{ca} -s3,d2,a2
B2 _{ca} -s3,d0,a3	B2 _{ca} -s3,d1,a3	B2 _{ca} -s3,d2,a3

B2_{ca}-s1a,d0,a1 is the best classification available for CCC cables



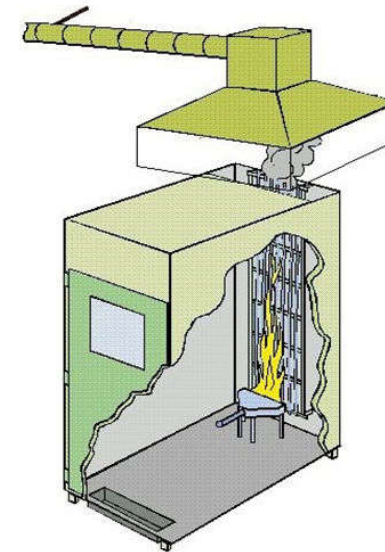
CPR Relevant standards

- EN 13501 - Classification
- **EN 50399 - Heat release and smoke production**
- IEC/EN 60332-1: Flame propagation
- IEC/EN 60754: Acidity of gas release
- IEC/EN 61034: Light transmission due to smoke



EN 50399 test procedure:

- Several cable samples, fixed side by side on a cable ladder
- Fire application time: 20 minutes (1200 seconds)
- Exhaust gases are analyzed for temperature and oxygen/carbon dioxide content (which gives information about the heat release)
- A light source & sensor in the exhaust pipe measures the smoke density
- The occurrence of flaming droplets is recorded



CPR data cables labels & marking


The CPR labels are an essential part of the proofs needed to be displayed when importing cables to the EU.

A sample of such a label is shown on the right.

Both the notified body and the manufacturers are identified by name or by code.

These labels are affixed to the cable drums (or box) in addition to the regular label.

It is NOT mandatory to print the cables with the CPR listing, but HCS has decided to do it, so cables are still CPR identified after they are removed from their original packaging.

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HCS - HES Cabling Systems Head Office: Oruc Reis Mah. Giyimkent Sitesi Vadi Cad. No: 3A Esenler / Istanbul, Turkey 2017 A04-4P23SF-HF1M-B
EN 50575:2014 H07-00402 Copper communication cable in buildings and other civil engineering works with the objective of limiting the generation and spread of fire and smoke Reaction to Fire: B2 _{ca} -s1a,d0,a1 Dangerous substances: none

CPR Certificates, DoP and Classifications Reports

The different CPR classes are tested, classified and announced differently:

Class B2ca & Cca:

Based on formal certificates issued by a System 1+ NB following a plant survey and complete testing program.

Class Dca:

Based on Classification Report issued by a System 3 NB following a plant survey and complete testing program and on self-declared DoP issued by the cable producer available online in all relevant local languages.

Class Eca:

Based on flame test report (IEC 60332-1) issued by a System 3 NB and on self-declared DoP issued by the cable producer available online in all relevant local languages.

Class Fca:

Based on self-declared DoP issued by the cable producer available online in all relevant local languages.

Note: This class includes outdoor cable that cannot pass IEC 60332-1 flame test or other cables that are not intended to be used in civil manned constructions.

All cables sold in the EU, without exception, must be labeled with a CPR label, enabling a clear classification according to one of the above classes.

Applying the CPR outside the EU

- The EU CPR is a detailed and systematic tool, based on a set of well-defined standards and test method, enabling consultants, designers, installers and end-users to increase the safety of people and buildings.
- Applying this tool is complicated and expensive, but saving lives and property should justify these efforts.
- Several countries outside the EU will adopt the CPR at least in public buildings, such as schools, hospitals, concert halls & theaters, government & municipality buildings etc.
- The CPR may be applied later in private constructions such as large office and residential buildings.

What CPR Class should be used?

The CPR does not dictate what CPR Class should be used – it merely provides clear classification of the products.

In theory, a building can contain only Class Eca cables, as was done until recently.

In fact, the cables do not have to be LSOH.

It is therefore the job of local (country, regional, municipal etc.) authorities to dictate the level of safety required for public construction projects, and the job of consultants and designers to do it in all private projects.

HCS recommendations for CPR implementation – Communications cables

Different countries implement the CPR differently, but there is a growing consensus about the importance of high-class CPR in buildings and locations with high-occupancy, and young children in particular. The following table shows a common-sense approach:

CPR Class	Recommended Buildings and location within buildings
B2ca-S1a, d1,a1	Hospital ward areas, Children’s nurseries and elementary schools, Fire exits, Public escape routes, Airports public halls, train and metro stations, high-rise building, data-centers and public shelters.
Cca-S1a, d1,a1	Hospitals general areas, Official & government buildings, Leisure facilities, schools (above elementary grades), universities, medium and small size hotels, administration and commercial buildings.
Cca-S1a, d2,a1	Privat homes, small offices, where only non-bundled cables are installed.
Dca-S1a,d1, a1	Storage facilities with certain human presence and combustible goods.
Dca-s2,d2,a1	Storage facilities with minimum human intervention and without any combustible goods
Dca-s2,d2,a3	Storage facilities with minimum human intervention and without any combustible goods, and where acid gas, and heavy smoke are not considered dangerous.
Eca	Non-combustible (metal , breaks and mortar) constructions for storage only.
Fca	Outdoor installations only

Thank you.

HCS Cabling Systems

