

Construction Products Regulation (CPR)

www.excel-networking.com/understanding-cpr

Section 5



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What is CPR?

The Construction Products Regulation (CPR) replaced the original Construction Product Directive in 2011. The 'EU/305/2011', to give it its formal name, has broadened its reach over time in terms of the products that it applies to. In 2016 a series of characteristics relating to a cable's reaction to fire were published. This led to legislation that sets out to harmonise these characteristics across all EU countries via a classification structure.

Why CPR?

Every year, many people die or are seriously injured as a result of building fires across the European Union. In 2015/16 in the UK alone, 17% of building fires were caused by structures and fittings within a building. Proportionally, 10% of casualties and 4% of deaths were caused by fire as a result of structures and fittings*, hence the importance of ensuring that all permanently installed cables are regulated to be as safe as possible to protect lives.

Ultimately the objective of CPR is to improve building safety by creating a common set of performance characteristics at national level to ensure everyone in the supply chain complies with the same set of standards.

CPR is key for saving lives, helping to provide a safer environment by creating maximum timeframes for people to evacuate a building in the event of a fire.

**(Source: FIRE0604: Primary fire fatalities and casualties by material responsible for development of fire, Gov.uk, July 2017).*

Why this update?

Following Brexit, the UK will transition to another form of marking called UKCA. The testing methodology and classifications will remain the same as they are all based upon accepted British Standards, such as BS EN50575 and BS EN50399. A more in depth briefing is given later in this chapter.

Which products are included?

Any cable which is deemed to be permanent once installed is within the scope of CPR, covering power, data and communications cables. In the case of data and communications cables, copper, fibre, coax, and multi-conductor cables are covered, with the exception of patch leads.

There are a few areas of confusion that need to be clarified.

Firstly, blown fibre is excluded from the regulation for the following reasons:

1. The tubes are deemed to be containment and outside the regulation
2. The fibre units are seen to be non-self sustaining outside the tube and therefore not a cable

Secondly, fire alarm cables are not currently covered by the regulation as they exceed the performance covered in the test method.

Finally, some multi-pair control cables just monitor a state, such as door contacts and are not used for communications. These are therefore grouped with power cables and excluded from the regulation in some countries however, in the UK BS6701 very clearly includes Multipair control cables.

Who is affected?

It is the legal responsibility of the manufacturer, distributor or wholesaler to ensure products entering the supply chain meet the requirements of the regulation, and in turn any minimum Euroclass required within a specific country or market.

Each layer of the supply chain, from factory through distribution, to specifier and installer of the products in scope have clear responsibilities to ensure market compliance with CPR.

These are summarised below:

Manufacturers

Have the legal responsibility to:

- Ensure that products are tested and classified.
- Ensure that the Declaration of Performance (DoP) is made available to the purchaser.
- Ensure that the product label carries the appropriate CE-Mark to EN 50575 standard, Euroclass, DoP ID, Notified Body ID and cheme of Assessment.

Distributors

Have the legal responsibility to:

- Ensure that cable supplied is accompanied with all required regulatory documents
- Ensure not to supply any product that they deem not to conform to its declared performance
- Ensure that products they believe do not meet either/both CPR or country specific minimum Euroclass requirements are withdrawn from the market
- Ensure product traceability is transparent and documentation such as DoPs are easily and freely accessible via web sites and catalogues
- Alert authorities to any cables they believe are being sold in the market that do not meet either/both CPR or country specific minimum Euroclass requirements
- Store and transport cables as not to ruin conformity

Specifiers

Have the legal responsibility to:

- Ensure technical specifications and tenders clearly state the required minimum Euroclass appropriate to the country or vertical market minimum requirement, as determined by regulators, standards bodies, or client
- Under the regulation the end-user has the legal responsibility for instructing the installer/integrator what Euroclass to install
- In the UK the minimum Euroclass is defined in BS6701:2016 +A1:2017 and is stated as Cca, S1b, d2, a2
- On the next page is a table of the current understanding of the requirements for other European countries. In some countries this is enforced by a regulation, whilst in others it is still a recommendation. Only in one country (The Netherlands) the installation company is also legally responsible for what is installed under the NEN8012

NB. The table is currently not complete as some countries are allowing the market to decide. Your assistance in getting it complete would be very welcome. Please email cpr@excel-networking.com with any information.

Flag	Country	Additional	Euroclass				Notes
			E	D	C	B2	
	Austria	S					No Data or decision
		D					
		A					
	Belgium	S			S1		Based upon Article 104 of General Regulations for Electrical Installations Acid Gas not defined
		D	Single Cables Only		d2		
		A					
	Bulgaria	S					No Data or decision
		D					
		A					
	Croatia	S					No Data or decision
		D					
		A					
	Cyprus	S					No Data or decision
		D					
		A					
	Czech Republic	S		s1*		s1**	* Residential and commercial buildings with more than 20 floors (others are only required to meet Eca)
		D		d2*		d1**	**Escape Routes in any Building
		A		a3*		a3**	Based on Decree No. 268/2011 Coll. amending the Decree 23/2008 Coll
	Denmark	S					No Data or decision
		D					
		A					
	Estonia	S		s2*		s1**	*Applicable to buildings less than 26 m high
		D		d2*		d1**	**Applicable to buildings more than 26 m high
		A		a3*		a3**	Based on Regulation no 17 Building's fire safety requirements and requirements of the fire water supply
	Finland	S		s2*	s1		* General Areas
		D	Building types ≠ I-V	d2*	d1		Based on standard SFS-7039 "Fire performance of cables. The Fire Product Levels of the Building Product Regulation correspond to the national fire performance levels"
		A		a2*	a2		
	France	S		s2	s1	s1a	Based on proposals by Sycabel (i.e. not a standard or Regulation)
		D	Possible	d2	d1	d1	
		A		a2	a1	a1	
	Germany	S			S1	s1	The information is based on national survey
		D	Possible		d2	d1	
		A			a1	a1	

Flag	Country	Additional	Euroclass				Notes
			E	D	C	B2	
	Greece	S		s2*		s1**	*Residential and commercial buildings with more than 20 floors (others are only required to meet Eca)
		D		d2*		d1**	** Escape routes in any building
		A		a2*		a1**	The information is based on draft Regulations on 04/2018
	Hungary	S					No Data or decision
		D					
		A					
	Iceland	S					No Data, however due to follow Norway when they finally announce/decide
		D					
		A					
	Ireland	S					No Data, announcement due early 2021
		D					
		A					
	Italy	S			s1b* & s3**		* High Fire Risk Areas
		D	Single Cables Only		d1* & d2**		** Residential and commercial buildings with less than 20 floors are only required to meet Eca
		A			a1* & a3**		The information is based on CEI 46-13/V1 "Guide to the characteristics and installation standards of communication cables" of 06/2017. B2ca-s1a,d1,a1 is also mentioned in the document but without a defined application area.
	Latvia	S					No Data or decision
		D					
		A					
	Leichtenstein	S					No Data or decision
		D					
		A					
	Lithuania	S		s2	s1*		* Escape routes in any building
		D	Single Cables Only	d2	d1*		
		A		a2	a1*		One or Two Bedroom apartments and Industrial/Warehouse buildings are only required to meet Eca
	Luxembourg	S					No Data or decision
		D					
		A					
	Malta	S					No Data or decision
		D					
		A					
	Netherlands	S		s3	s1	s1	The information is based on NEN8012 The Netherlands are the only country that also makes the installer legally responsible for what is installed under the above regulation.
		D		d2	d1	d1	
		A		a3	a1	a1	

Flag	Country	Additional	Euroclass				Notes
			E	D	C	B2	
	Norway	S		s3			
		D		d2			
		A		a2			The information is based on NEK 400 (implementation of HD 60364)
	Poland	S		s2**		s1b***	* In some industrial production/ Warehouse and Livestock Buildings
		D	Possible*	d1**		d1***	** For installation in Residential and Commercial Buildings out side of Escape Routes
		A		a3**		a1***	*** For installation in Residential and Commercial Buildings inside Escape Routes. Based on Information from Standard N SEP-E-007:2017-09
	Portugal	S		s2			
		D	No Public Access	d2			
		A		a1			The information is based on ITED Regulation
	Romania	S					
		D					No Data or decision
		A					
	Slovakia	S					
		D					No Data or decision
		A					
	Slovenia	S					
		D					No Data or decision
		A					
	Spain	S		s2			* Coaxial cables only have to meet Eca
		D	Coaxial Cables *	d2			
		A		a2			The information is based on CTI Regulation
	Sweden	S		s2	s1*		* Escapes routes with more than 5% ceiling space given to cabling
		D		d2	d1*		
		A		a2	a2*		Information is based on Boverkets Regulation
	Switzerland	S					
		D					No Data or decision
		A					
	United Kingdom	S			s1b		
		D	Other than Installation Cables		d2		
		A			a2		The information is based upon the Standard BS6701:2016 +A1:2017

Installers

Have the legal responsibility to:

- Ensure that all installed cable is correctly marked and accompanied with correct Declaration of Performance (DoP)
- Ensure technical specifications and tenders requirements are met, adhering to the minimum Euroclass appropriate to the country or vertical market minimum requirement, as determined by regulators, standards bodies, or client
- If in doubt, contact the client for instruction or the manufacturer for assistance in how to advise the customer

CPR Characteristics

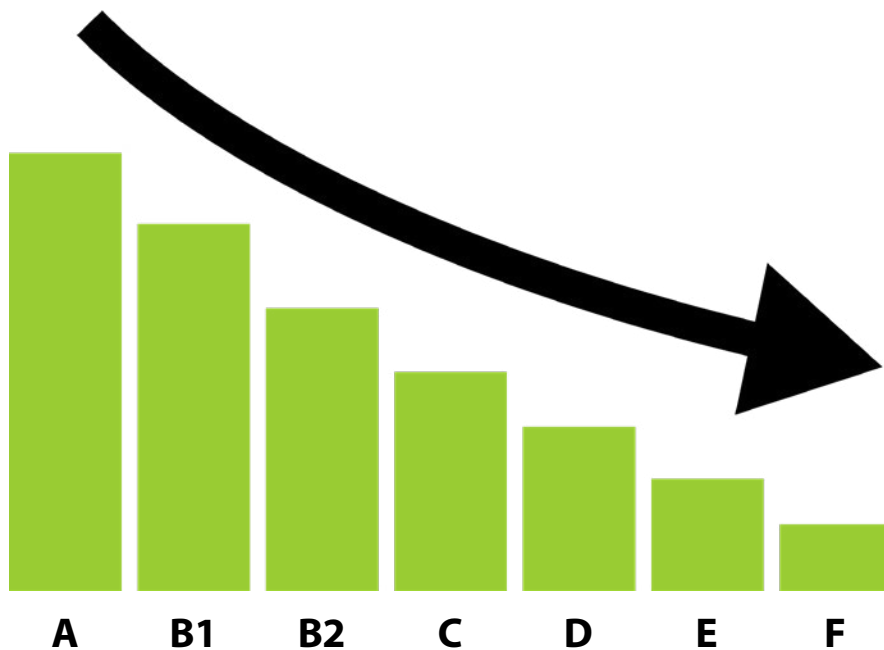
The CPR update means performance tests on a cable's reaction to fire will now be performed on; flame spread, heat release, smoke production, light transmittance, flaming droplets and acidity. Cables will be categorised according to their performance level denoted by unique classification codes. In general the higher the performance class the higher the cable cost, due to differences in materials used, cable design and certification process, as has previously been seen when comparing PVC and LS0H cables.

		Additional Requirements						
Flames		Aca	B1ca	B2ca*	Cca	Dca	Eca	Fca
Heat		Aca	B1ca	B2ca*	Cca	Dca	Eca	Fca
Smoke	s			s1a	s1b	s2	**	
Droplets	d			d1	d1	d2	**	
Acidity	a			a1	a1	a2	**	
		Reaction to Fire						
		LOW						HIGH

The above categorisation elements will be specified to form a complete Euroclass reference for ordering and specification purposes, for example Cca, S1b, d1, a1.

*We do not expect that communication cables will ever be above B2ca

** No Requirement





Smoke Production Explained

The levels of Total Smoke Production (TSP) and the Smoke Production Rate (SPR) determine how quickly people will be able to find their way out of a building easily in the event of a fire. By measuring the smoke density of burning cables and evaluating the levels of light that can be transmitted in a test environment, the different levels of visibility are clear.

The exposure period shall originate from the test with 20,5kW flames.

S5

Smoke Production Classification	Measurement	Test Period
s1	TSP1200 ≤ 50 m ² Peak SPR ≤ 0.25 m ² /s/50 m ² Peak SPR ≤ 0.25 m ² /s	20 minutes
s2	TSP1200 ≤ 400 m ² Peak SPR ≤ 1.5 m ² /s	20 minutes
s3	Products for which no performance is declared or where the product does not comply with either 's1' or 's2'.	-
Additional Testing (in accordance with EN61034-2)		
s1a	s1 and transmittance ≥ 80%	20 minutes
s1b	s1 and transmittance 60% < 80%	20 minutes

Legend: TSP = Total Smoke Production SPR = Smoke Production Rate

Note: Having just s1 may not be sufficient to meet the requirements of some countries in Europe including the UK, who have specified the additional testing requirements of s1b for Cca class cables.



Flaming Droplets Explained

The flaming droplets segment of the classification determines the risk of personal injury during evacuation from falling flames. Additionally, the different levels indicate the potential for secondary fire sources being created by flaming droplets falling from the burning cables.

The exposure period shall originate from the test with the 20,5 kW flames.

Flaming Dropets Classification	Measurement	Test Period
d0	No flaming droplets occur (droplets may fall but they must not be alight)	20 minutes
d1	No flaming droplets occur for longer than 10 seconds (these droplets may happen but they must self-extinguish within 10 seconds)	20 minutes
d2	Products for which no performance is declared or where the product does not comply with either 'd0' or 'd1'.	-

Acid Gas Explained

The levels of acid gas determine a person's ability to breathe properly during a fire evacuation without choking. Levels of acid gas are assessed in accordance with EN 60754-2 and have two values; conductivity and acid gas.



Acid Gas Classification	Measurement
a1	<2.5 µS/mm pH value of > 4.3
a2	<10 µS/mm pH value of > 4.3
a3	Products for which no performance is declared or where the product does not comply with either 'a1' or 'a2'.

Legend:

µS = Micro Seimens (conductance or a measure of dissolved solids in a liquid)

pH = Potential for Hydrogen (the scale of acidity)

Euroclass Criteria

Euroclass (ca)	Classification Criteria	Additional Criteria	Attestation of conformity system
A	BS EN ISO 1716 Gross heat of combustion		1+
B1	BS EN 50399 Heat release Flame spread	Smoke production* (s1a, s1b, s2, s3) BS EN50399/BS EN61034-2	Initial type-testing and continuous surveillance with audit testing of samples by 3rd party certification body factory production control (FPC) by manufacturer
B2		Acidity (a1, a2, a3) BS EN 50574	
C		BS EN 50575 Flame propagation	
D		Flaming droplets (d0, d1, d2) BS EN 50399	3 Initial type testing by 3rd party laboratory
E	BS EN 50575 Flame propagation		FPC by manufacturer
F			4 Initial type testing and FPC by manufacturer







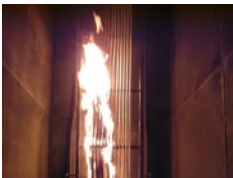

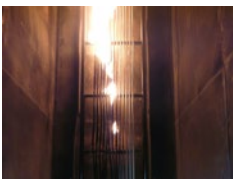
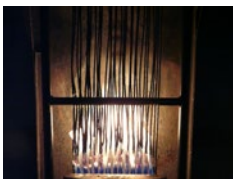
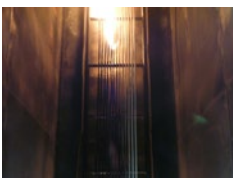
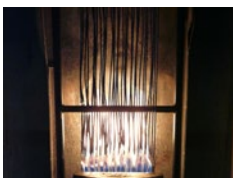
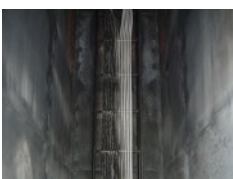

*BS EN50399 covers the test for s1,s2 & s3, which covers smoke production. BS EN61034-2 is an additional test carried out for s1 only, to define the density of the smoke produced, hence s1a.

The Importance of Choosing a Euroclass

When selecting a CPR-compliant cable, it is important to consider which Euroclass to select. Each member state has their own national minimum standards which installations must comply with - this will be discussed in more detail throughout this chapter - however the following images in the table show the difference between two differently classified cables, which gives a strong indication of the retardance to fire and the impact that a fire could cause.

BS EN50399 Flame FS Requirement: B2ca \leq 1.5; Cca \leq 2.0; Dca: no requirement

S5

Time	Dca Example	B2ca & Cca Example
Before test		
1 minute		
3 minutes		
5 minutes		
10 minutes		
17 minutes		
After test		

Excel Networking Solutions and CPR

Excel customers can rest assured that our copper and fibre cabling solutions meet a wide range of application and UK & EU member state requirements. Our sales and technical support teams have an extensive knowledge of CPR requirements, and how the changes will impact upon our customers, so we are able to provide you with the right advice to ensure your installations are compliant.

All products supplied by Excel into the EU market since 1st July 2017 are CPR compliant. We demonstrate this through certificates known as Declarations of Performance (DoPs) (available on the [Excel website](#), through labelling on product packaging, printing in the legend on the outer sheath of the cable jackets, or by the product being placed on the market prior to this date. A product's Euroclass will also appear on all Excel Networking specification sheets and in forthcoming editions of the product catalogue, along with sub-classifications for smoke development, flaming droplets and acidity.

A product should not be purchased if this claim is made and a DoP cannot be provided with a matching part code and description to the part in question.

Excel has adopted a transparent approach to providing the market with relevant information, updating its data sheets and web content to include clear references to the Euroclasses that each product meet, and DoPs for each item.

For more detail on the Regulation please refer to the Excel website, contact your local Excel distributor or installer, or contact us directly.

Offering Support

Our expert sales teams can give you a clear vision of the products you need with the correct documentation, advice and installation tools.

Providing Clarity

A consistent labelling system across all Excel cabling products aim to satisfy the requirements of CPR by denoting ten specific parameters:

1. The Excel logo and address details
2. The product part number
3. The CE marking
4. The year of initial certification
5. The classification of reaction to fire
6. The reference to the standard
7. The certification body
8. The ID of the Declaration of Performance
9. The intended use of the cable.

This label layout is consistent across all infrastructure products supplied by Excel, showing all mandatory information making it easier to explain to customers.

Exceeding Requirements

Excel products across the range of copper and fibre solutions already exceed the minimum requirement of related country specific standards. For example, in the UK we exceed the requirements of BS6701:2016+A1 2017, as we offer Cca, s1b,d1,a1 as standard. It is important when considering vendor offerings to ensure this full Euroclass is met and all required paperwork and labelling is in order.

We have produced a series of "Excel Explains" webinar videos specifically dedicated to the Construction Products Regulation and the BS6701:A1. These have been designed to provide important technology updates in bite size sessions and are based on frequently asked questions received by our Technical Team in relation to CPR. Topics include further details about the meaning of the smoke, droplets and acidity ratings, as well as comparing Eca versus Dca Euroclasses, among other topics.

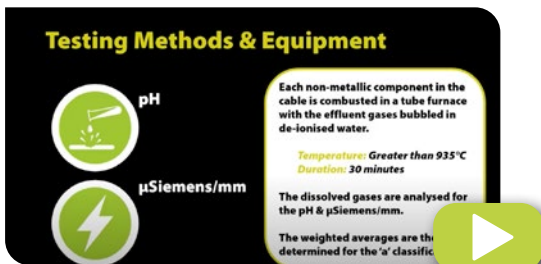
Click on the images or links below to watch individual webinars. Alternatively, [click here](#) to view the full playlist.



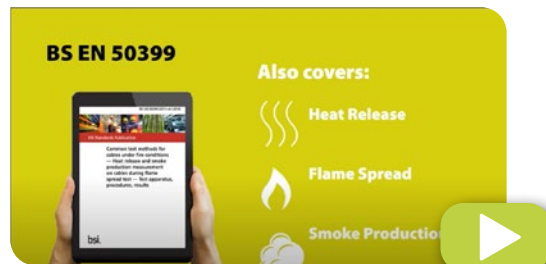
Smoke Classification
<https://youtu.be/ys3DGyp4qls>



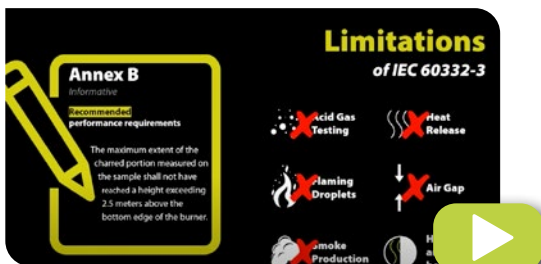
Eca vs Dca
<https://youtu.be/ZBlmsXqKsLg>



Acid Gas Testing
<https://youtu.be/2qSt6UhnfjU>



Flaming Droplets
https://youtu.be/jdUZD7_sYts



CPR vs IEC 60332 3
<https://youtu.be/dMMIN8Lqxtc>



CPR and BS 6701:2016+A1:2017
<https://youtu.be/M3shTWslYSw>



CPR and BS6701:A1 At A Glance
<https://youtu.be/OY5EPVGPdjC>



Watch the
entire playlist

The UK Market and the transition to UKCA

It is the responsibility of each EU member state to define the recommended minimum Euroclass for installations within its market.

The UK market is currently unregulated and therefore no government or independent body owned this responsibility when the regulation became a legal requirement on 1st July 2017.

On 30th November 2017 the British Standards Institute issued BS6701:2016+A1:2017, an amendment to the frequently used standard entitled "Telecommunications Equipment and Telecommunications Cabling – Specification for installation, operation and maintenance." Within this amendment is the requirement to adopt a specific minimum class in order to comply with this standard.

In September 2019 the UK Government published Statutory Instrument 2019 No 465, which laid out the process starting 1st January 2021: How the UK will transition to a new marking system designated UKCA (UK Conformity Assessed).

Let us be clear - the issue facing all manufacturers is not with the product. As it has been confirmed that the UK approval scheme will be a mirror of the current CPR, all the relevant EN standards are already UK designated standards and prefixed with BS as UK adopted. In this way, the AVCP (testing and FPC) will be no different.

The problem is with the accredited bodies. After 1st January 2021 the EU27 NB (Notified Bodies) will not be able to test and certify products to the UKCA scheme. Instead, they will have to be UK-based Designated Bodies. Currently there are only three, however a number of EU27 NB have stated that they intend to set up a UK-based legal entity to enable them to qualify as UK Designated Bodies. In this instance they will be able to use the existing test data and files to re-certify the product to the new designation.

As a part of the move away from CE marking to UKCA, the government has allowed a 1-year transition period. Therefore until 1st January 2023, it will be permissible to supply CE marked product that meets the requirements of the UK market. As with the initial introduction of CPR, Excel's intention is to continue to lead in this area.

BS6701:2016+A1:2017 & Minimum Class

The amendment states that the minimum Euroclass for telecommunications cable within scope of CPR shall be Cca.s1b.d2.a2.

It is important to understand that there are varying levels of performance for each of the measured parameters that lead to a product Euroclassification and issuing of DoPs.

For example, within the measurement of smoke a cable maybe classified as 'S1' 'S2' or 'S3' – none of which would meet the minimum requirement as stated within the amended BS6701 as these classifications refer only to smoke production, and do not consider light transmittance. When this important parameter is measured, a suffix of 'a' (being the highest possible) or 'b' is added to denote certified performance.

Excel products meet or exceed the minimum requirements defined within BS6701:2016+A1:2017 – across each of the previously mentioned performance categories.

We strongly recommend you ask for DoPs and product specification sheets to confirm whether products offered by alternative suppliers meet each element of the required specification, checking each part of the Euroclass definition carefully.

This check – against a DoP – should confirm independent certification for Cca, for S1b, for d2, and for a2, as a minimum to meet the minimum requirements of the standard. Anything less than this, is quite simply not compliant. For example any product offered as S1 does not meet the standard.

Your Questions, Answered

Why CPR for cables?

There was no harmonised structure for how a cable reacts to fire, therefore resulting in varying safety standards at a national level. The introduction of CPR, and specifically a series of classification criteria, known as 'Euroclasses', created a common set of performance characteristics, test and documentation processes and a timeline for compliance for all those in the supply chain, from specifiers, through manufacturing and distribution to installation organisations. Ultimately the objective of CPR is to improve in building safety, this will be achieved through this new set of reaction to fire specifications, enabling local regulators and clients to select the performance requirement at national or even project level from the Euroclasses which are defined in BS EN 50575:2014.

NEW
for
V5

S5

UPDATED
for
V5

Which products are in the scope?

Any cable which is deemed to be permanent once installed is within scope of the CPR. This covers power, data and communications cables. In the case of data and communications cables copper, fibre, coax, and multiconductor cables are covered, with the exception of patch leads.

There are a few areas of confusion that need to be clarified.

Firstly, blown fibre is excluded from the regulation for the following reasons:

1. The tubes are deemed to be containment and outside the regulation
2. The fibre units are seen to be non-self sustaining outside the tube and therefore not a cable.

Secondly, fire alarm cables are not currently covered by the regulation as they exceed the performance covered in the test method.

Finally, some multi-pair control cables just monitor a state, such as door contacts and are not used for communications. These are therefore grouped with power cables and excluded from the regulation in some countries however, in the UK BS6701 very clearly includes Multipair control cables.

What characteristics are tested?

CPR focuses purely on a product/materials reaction to fire. All other performance and specification criteria for cables are defined in separate, established standard or vendor specific documents. In the case of cable, four key characteristics are measured and are central to the classification matrix that customers and regulators will use to specify the minimum and maximum required specification, these are:

- Propagation and heat emission
- Smoke emission
- Burning droplets
- Acid gas emission

The individual performance standard required for each of these four measures is found in the aforementioned EN50575:2014 standard documentation.

How do I ensure I have CPR compliant products?

As previously mentioned processes have been defined within European standards to enable customers to purchase and install product in a confident and traceable manner. Specifically, what are known as Declarations of Performance (DoPs) and a standardised method of labelling on the product packaging. Whilst it is not a requirement to mark products to denote CPR compliance, or the related Euroclass, it is expected that most manufacturers, including Excel will do so. Declarations of Performance (DoPs) are legal documents prepared by manufacturers and are placed in the public domain, following testing by independent organisations known as 'notified bodies'.

How do we meet current, and advise on future customer requirements?

To provide some guidance on this question we need to separate CPR from Euroclass. CPR is UK & EU wide regulation, it is mandatory, product supplied into the market from 1st July 2017, must be CE or UKCA marked and hold DoPs to confirm testing completed, and certification gained.

Euroclasses provide a range of low to high reaction characteristics, how these are applied will vary from country to country, and in some instances building type to building type. In the majority of countries within the EU the directive over choice of Euroclass will be driven by regulators, or equivalent bodies, and customers should seek this local clarification either via our sales teams, distributors or independent sources.

Please refer to www.excel-networking.com/understanding-cpr for further updates on CPR.

S5



View our
CPR Infographic
online