

Construction Products Regulation (CPR) and cables

British Cables Association Guidance to Specifiers

Outline

In January 2017 BCA issued its “Guidance to Specifiers”. A key consideration at the time was that with effect from 1st July 2017 it would become obligatory for cables, having an intended use for permanent installation in buildings and construction works, to be accompanied by a Declaration of Performance (DoP) and to have CE marking under the CPR. This requirement related only to the **Reaction to Fire** performance of the cables, and excluded those cables which have **Resistance to Fire**, meaning that the intended use is retention of functionality during a fire.

NOTE: Cables having **Resistance to Fire**, remain under review, and may be covered at an, as yet, unknown date in the future. Such cables cannot be given a DoP or have CE marking in respect of Reaction to Fire unless and until relevant EU legislation, and accompanying standardization, is completed.

Apart from this specific exclusion, all cables, be they energy, metallic data or optical fibre types, are covered.

It is the responsibility of the manufacturer to provide the DoP and to apply CE marking, but the main purpose of this paper is to offer advice and guidance to those who have the responsibility to specify the use of cables within construction works. Such groups of specifiers may be local authorities, architects, designers and the like.

In particular, the paper acknowledges that, unlike many other EU countries, the UK has no legislation that determines the level of performance required for the cables with respect to reaction to fire, nor is it likely to in the near future. The paper therefore explains the nature of the choices available via voluntary guidance such as British Standards, and the performance that can be expected, including by relation to existing parameters and requirements.

Background

The essential origins of bringing cables within the Construction Products Regulation and the associated timetable for implementation were explained in BCA’s statement of July 2016 – see

<http://www.bcauk.org/application/files/9615/1525/2498/BCA-CPR-public-statement.pdf>

NOTE: The statement and this paper exclude any complications or changes arising from BREXIT, as any effects are at present unknown.

The CPR covers the way in which the product is placed on the market. It does not say how and where a particular product should be used. Crucially it does not say what class of product should be used in any given circumstance.

In many EU countries the national authorities are in the process of introducing, or have introduced, legislation to say that certain applications/installations must have certain CPR classes of cable. In some countries this will be via the national wiring regulations which, unlike BS 7671 in UK, can have a statutory position.

In UK there is a long history of developing low fire hazard cables with low smoke, halogen-free performance (variously LSHF, LSOH, OHLS, LSNH etc), but no statutory requirements exist for their use. This is well understood by specifiers and designers of buildings and there is some provision written into BS 7671, though it is as well to recall that, by comparison with statutory requirements,

the British Standard counts as voluntary guidance. It can of course be called up in a legally-binding contract. This is explained in more detail in the recently released BCA statement – see:

http://www.bcauk.org/application/files/4215/2292/1826/CPR_and_cables_-_UK_position_March_2018.pdf

The UK government had said a long time ago it will not amend the Building Regulations as far as Reaction to Fire for cables is concerned, though it is possible that this may change in the wake of the enquiries relating to Grenfell Tower. If there is a change, then it is likely that specific guidance would be given via Approved Document B “Fire safety”. Therefore, for now, there may be some benefit in offering advice and guidance to specifiers, especially in respect of any relationship between existing requirements and those derived from the CPR.

What is available already?

A major pre-existing document of relevance is BS 7671 (IET Wiring Regulations). It specifies reaction to fire characteristics for cables in a number of places, most but not all of which are for installations in buildings and construction works and therefore fall under CPR.

NOTE: The existing version of BS 7671 is the 17th edition of the IET Wiring Regulations. An 18th edition is in preparation with publication scheduled for 1st July 2018, and a “coming into effect” of 1st January 2019. The final text has had its technical content approved. It makes no significant change in respect of the requirements for cables in respect of Reaction to Fire.

The existing requirements of BS 7671 can be used to illustrate the most important determinant for cables and reaction to fire under CPR – namely the classification.

The classification splits cables into 7 classes in respect of their reaction to fire. They range from Class A_{ca}, being essentially non-combustible, as for instance bare MICC, through to class F_{ca}, which is for cables having no measurable resistance to the spread of flames. All classes are summarised in Annex A.

For the vast majority of practical purposes it will be the classes from E_{ca} up to B2_{ca} that are most likely to be applicable. By reference to existing requirements in BS 7671 the significant comparisons are:

Existing requirement in BS 7671	CPR class and equivalence	Comments
BS EN 60332-1-2 (Bunsen burner test)	Class E _{ca} is an exact equivalent to the requirement of BS EN 60332-1-2	Minimum requirement for any application within buildings and construction works
BS EN 60332-1-2 and BS EN 60332-3	No direct equivalence, but classes above class E _{ca} should be used.	The choice of class is a matter for the user, bearing in mind that a better performance is given by a higher class
BS EN 60332-1-2, BS EN 60332-3 and BS EN 61034-2	No direct equivalence, but classes above class E _{ca} should be used, and must include at least the additional classification for smoke (see Annex A)	The choice of class is a matter for the user, bearing in mind that a better performance is given by a higher class. A minimum additional classification for smoke of s2 is required

From the above it can be seen that, with the exception of Class E_{ca}, the European classification for reaction to fire of cables does not directly correlate with the existing fire performance requirements for cables in British Standards. On the basis that the UK Government was not planning to introduce the classes, and in order to allow time to assess market needs, no changes have yet been made to cable product standards, be they British Standards or BS implementations of CENELEC standards.

For some specific telecommunication installations, requirements for fire performance of cables are now given in BS 6701 (as amended in 2017). The new amendment has two specific classes of performance, Class C_{ca} for what are defined as “installation cables” in specified high risk areas, and Class E_{ca} for all other telecommunication cables. From a regulatory point of view, as with BS 7671, the standard is classed as voluntary guidance.

Cautionary notes

Bearing in mind that the legalistic position is that any class automatically satisfies the requirements of the classes below, and hence for instance class C_{ca} is automatically “better” than class D_{ca}, it may be tempting to play safe and specify the highest possible class. This should not be done without being sure that every family of cable to be used in a particular construction works is available, with the necessary authentication, i.e. DoP and CE marking derived from certification via a Notified Body. It is also advisable to ask whether every type of cable for every kind of installation needs to have the same class of performance. Cables installed singly, or in small numbers, in protected situations may not need such a high class as for large bunches in areas of high risk. Furthermore, risk assessments, such as those described in BS 9999, may point to alternative means of ensuring fire safety other than vis prescriptive requirements for materials and products, such as cables, in buildings.

In addition, it should be recalled that the position of cables under CPR at present relates only to two Essential Requirements, or as they are properly called Basic Requirements of Construction Works (BRCW).

These are:

- Reaction to fire
- Dangerous substances

A cable that satisfies only these BRCWs is almost certainly not fit for purpose. Electrical and mechanical performance are covered via existing standards and users should ensure that the relevant performances for these requirements, are also satisfied, for instance in UK via a 3rd party certification and approval system, such as BASEC.

BCA recommendations

Taking account of all the above factors, and recognising that a very wide range of buildings and construction works are embraced by CPR, BCA recommends that specifiers should adopt the following guidance for the use of cables under the regulation:

1. Always specify that cables must have the CE marking according to CPR, accompanied by a Declaration of Performance (DoP);
NOTE: It is the responsibility of the specifier/purchaser/user to be satisfied that the information on the DoP is accurate and authentic. Some examples of incorrect and misleading DoPs have already been seen, including those where the declared class is higher than may be expected, and cannot be verified.
2. Take due note of the relationship between the statutory regulation, and relevant documents that are classed as guidance, such as BS 7671;
3. Specify cables of class E_{ca} or higher;
4. Preferably use cables described as low fire hazard or equivalent, in particular where fire safety requirements are high or very high;
5. Ensure that low fire hazard cables above class E_{ca} include the additional classifications for smoke and acidity (LSHF, LSOH, OHLS, LSNH etc) and, for particular applications, flaming droplets;
6. Avoid cables classified as F_{ca}, as they are likely to burn uncontrollably in a fire;
7. In case of doubt, consult the manufacturer.

Annex A: Reaction to fire classes for cables

Class ¹	Classification criteria ²	Test method(s)	Approximate performances of different classes according to EN13501-6	Additional classification ³	Test method(s)
A _{ca}	Gross heat of combustion (PCS)	EN ISO 1716	Level of highest performance corresponding to products that practically cannot burn		
B1 _{ca}	<ul style="list-style-type: none"> • Vertical flame spread (FS) • Total heat release (THR) • Maximum value of heat release (Peak HRR) • Fire growth rate index (FIGRA) 	EN 50399 30 kW flame source (very high intensity)	Products that are combustible but show no or very little burning	Smoke production Flaming droplets/ particles Acidity	EN 61034-2 EN 50399 EN 60754-2
	Vertical flame spread (H)	EN 60332-1-2			
B2 _{ca}	<ul style="list-style-type: none"> • Vertical flame spread (FS) • Total heat release (THR) • Maximum value of heat release (Peak HRR) • Fire growth rate index (FIGRA) 	EN 50399 20.5 kW flame source (high intensity)	Products that are combustible but show very little burning	Smoke production Flaming droplets/ particles Acidity	EN 61034-2 EN 50399 EN 60754-2
	Vertical flame spread (H)	EN 60332-1-2			
C _{ca}	<ul style="list-style-type: none"> • Vertical flame spread (FS) • Total heat release (THR) • Maximum value of heat release (Peak HRR) • Fire growth rate index (FIGRA) 	EN 50399 20.5 kW flame source (high intensity)	Products that do not give a continuous flame spread, show a limited fire growth rate and show a limited heat release rate	Smoke production Flaming droplets/ particles Acidity	EN 61034-2 EN 50399 EN 60754-2
	Vertical flame spread (H)	EN 60332-1-2			
D _{ca}	<ul style="list-style-type: none"> • Total heat release (THR) • Maximum value of heat release (Peak HRR) • Fire growth rate index (FIGRA) 	EN 50399 20.5 kW flame source (high intensity; NO flame spread measured)	Products that show a continuous flame spread, a moderate fire growth rate, and a moderate heat release rate.	Smoke production Flaming droplets/ particles Acidity	EN 61034-2 EN 50399 EN 60754-2
	Vertical flame spread (H)	EN 60332-1-2			
E _{ca}	Vertical flame spread (H)	EN 60332-1-2	Products where a small flame attack is not causing large flame spread		
F _{ca}	Vertical flame spread (H)	EN 60332-1-2	Flammable		

¹ The level of reaction to fire performance decreases in going from Class A_{ca} to Class F_{ca}

² The full description of the classification criteria, the symbols used and the numerical values of reaction to fire performance are given in the Commission delegated regulation (EU) 2016/364 of 1 July 2015 (L 68/4 - 15 March 2016). These will eventually be taken into an updated version of EN 13501-6 *Fire classification of construction products and building elements - Part 6: Classification using data from reaction to fire tests on electric cables*

³ The additional classifications apply only to Classes B1, B2, C and D. They are optional, but should be regarded as essential for use with cables described as "low smoke" and/or "halogen-free". Their full description can be found in the same documents as for footnote 2 above

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