



The Fibreoptic Industry Association

[www.fia-online.co.uk](http://www.fia-online.co.uk)

Secretary: Jane Morrison

The Manor House  
BUNTINGFORD  
Hertfordshire SG9 9AB  
United Kingdom

Tel: +44 (0) 1763 273039 Fax: +44 (0) 1763 273255

e-mail: [jane@fiasec.demon.co.uk](mailto:jane@fiasec.demon.co.uk)

## THE PUBLICATION OF BS 6701 AMENDMENT 1:2017 - IMPLICATIONS FOR CABLE SUPPLIERS AND CABLING INSTALLERS

By Mike Gilmore,  
Director, [standards@fia](mailto:standards@fia).  
Chairman, CENELEC TC215

On November 30<sup>th</sup> 2017, the Amendment 1 of BS 6701:2016 was released by BSI. The substantive part of the amendment relates to the statement of requirements for telecommunications cables in terms of "EuroClass" under the Construction Products Regulation (CPR) in relation to their reaction to fire performance.

This is the first time BS 6701 has been forced to mention reaction to performance although its sister publication, BS 8492 has focussed on this topic since 2009. However, BS 8492 is only a Code of Practice, providing guidance on the subject whereas BS 6701 is a full British Standard, which as stated above, contains requirements.

### Why has it been necessary to publish the amendment?

The CPR does not state where cables of a given EuroClass shall or should be used. That is left to national standards or legislation.

In the past, BS 6701 has relied upon BS 7671 (better known as the IET Wiring Regulations) for the provision of installation requirements in relation to fire performance of cable. However, since the full implementation of the CPR on 1<sup>st</sup> July 2017 it has become evident that the revision of BS 7671 (as the 18<sup>th</sup> Edition, to be published mid-2018), will not translate of its existing British Standards for reaction to fire performance into those of EuroClasses in line with Article 8.3 of the Regulation. The reasons for this aberration are a matter primarily for the power cable industry to justify. However BS 7671 points to BS 6701 for telecommunications cabling and as a result, BSI have acted to implement requirements appropriate to the world of telecommunications cabling within the published Amendment.

### The requirements summarised

The requirements of BS 6701 A1 apply to all cables installed inside the boundary created by the external fire barrier of a building or other structure. The external fire barrier is the first barrier encountered by any service passing into the building. The barrier is typically defined in three dimensions (e.g. the foundations and roof space of the construction and normally, but not always, the exterior walls of the building).

Within this boundary, BS 6701 A1 define two types of cable only - "installation cables" and "other cables" which are subject to different requirements, independent of the designation of space inside the building in which they are installed.

***Installation cables shall, as a minimum, meet the requirements of EuroClass C<sub>ca</sub>-s1b,d2,a2, in accordance with BS EN 13501-6***

***Other cables shall, as a minimum, either:***

- ***meet the requirements of EuroClass E<sub>ca</sub>, in accordance with BS EN 13501-6 or***
  - ***meet the recommended requirements of BS EN 60332-1-2.***

## What is an installation cable?

Installation cables are defined as “**cables intended for installation into pathways which are hidden (below floors, above ceilings, behind walls) or to which access is limited and which can either be terminated in-situ or “preterminated”**”.

It is important to explain “pathways” and for that we look in BS EN 50174-1 for a definition “**pathway: defined route for cables between termination points**”.

To fully understand the definition of “installation cables” we need to understand that pathways are not cable management systems - they are simply the “defined route” that the cable takes. Therefore if a cable is in a conduit, duct or trunking system its route (i.e. pathway) is hidden. If a cable runs in a tray or basket then it is not necessarily hidden but if it requires a ladder or equivalent to reach that pathway then access to it is limited.

So rather than discuss “installation cables” it is easier to consider what an “other cable” would be. An “other cable” would be not intended for installation into pathways which are hidden or to which access is limited. To qualify as such the data sheet or installation instructions for the cable would have to make such an installation condition clear.

### What would qualify as an “other cable”

A jumper cable, a patch cord or an equipment cord would contain cables that typically would be considered as an “other cable” since these would be typically housed in or between cabinets, rack or frames. BS 6701 A1 allows such cables to meet the lowest “reaction to fire” EuroClass with a defined performance i.e. EuroClass E<sub>ca</sub>.

However if such cords were installed in pathways which are hidden or to which access is limited then their status would be that of an “installation cable” - and they would have to meet EuroClass C<sub>ca-s1b,d2,a2</sub>.

Cables which are specifically restricted to “non-permanent” incorporation within construction projects are excluded from the scope of the CPR. Such cables are still required to meet the recommended performance requirements of BS EN 60332-1-2. As a result we have two performance options for the “other cables”. An example of such a cable is one for which the supplier instructions state that it intended to be installed by stapling to a skirting board. The pathways would be neither hidden nor difficult to access and it would classify as an “other cable”. If an installer then hides this cable then the suppliers instructions are not being followed (so is non-complaint with BS EN 50174 standards) and it is would become an “installation cable” and would not conform to BS 6701 A1 which requires it to be of EuroClass C<sub>ca-s1b,d2,a2</sub>.

## Designation of spaces

Unlike BS 7671, BS 6701 does not discriminate where is the building the cables are installed. The single, simple, universal requirement for “installation cables” applies everywhere. The reasons for this are:

- telecommunications cables are generally routed on a point-to-point basis resulting in higher volumes of cables when compared with the power cables serving the same spaces
- telecommunications cables, whether high performance metallic or optical fibre cables, cannot be jointed as they pass from a space of one “category” to another without significant performance degradation.

As a consequence, the fire performance of a telecommunications cable has to be selected to reflect the requirements of the most demanding space from the fire perspective - which is generally an “evacuation route”. It is recognised that the use of a space can change during the lifetime of a building and that cables are rarely re-installed to match the nature of the space in relation to the key fire safety aspects.

### Does it matter how many cables are installed?

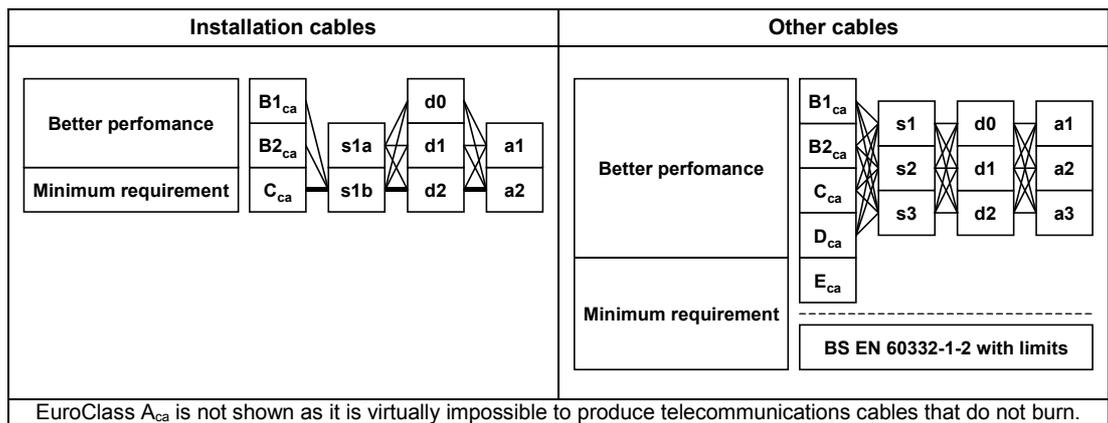
The single, simple, universal requirement for “installation cables” applies to any quantity of cables. There is no realistic possibility of restricting the number of cables installed in a particular pathway except for those in pathway systems such as small conduits (which are by definition required to meet EuroClass C<sub>ca-s1b,d2,a2</sub>).

**EuroClasses for telecommunications cables**

The EuroClass system of EN 13501-6 indicates the performance of a telecommunications cable in relation to a number of “essential characteristics” as follows:

- for EuroClass E<sub>ca</sub>
  - flame spread;
- and for D<sub>ca</sub> to B1<sub>ca</sub>
  - flame spread;
  - heat release;
  - smoke production (relevant for evacuation and fire-fighting activities) - designated with a sub-classification “s”;
  - flaming droplets (which may be establish fire in adjacent materials) - designated with a sub-classification “d”;
  - acid gas generation (relevant for equipment survival) - designated with a sub-classification “a”.

The figure below shows the minimum requirements and options for improved performance for “installation cables and “other cables”



**BIBLIOGRAPHY**

**BS 6701 2016 + A1:2017**, Telecommunications equipment and telecommunications cabling - Specification for installation, operation and maintenance

**BS 7671:2008+A3:2015**, Requirements for Electrical Installations - IET Wiring Regulations

**BS 8492:2016 +A1:2017**, Telecommunications equipment and telecommunications cabling - Code of practice for fire performance and protection

**EN 13501-6:2014**, Fire classification of construction products and building elements Part 6: Classification using data from reaction to fire tests on electric cables

**EN 60332-1-2:2004+A11:2016**, Tests on electric and optical fibre cables under fire conditions. Test for vertical flame propagation for a single insulated wire or cable. Procedure for 1 kW pre-mixed flame

End of report  
Mike Gilmore  
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