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GUIDANCE ON THE COMMERCIAL IMPACT OF THE EXTENSION OF THE CONSTRUCTION PRODUCTS REGULATION TO TELECOMMUNICATIONS CABLES

by
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Introduction

From 1st July 2017, all energy, communications and control cables that are placed on the market and intended to be installed in a "permanent" manner inside buildings and other structures have to be certified as being conformant to a specific EuroClass in relation to "reaction to fire".

Annex A of this document provides some explanation of the EuroClass system.

The EuroClass itself does not dictate where the cables can be or may be used. Each country can decide this either via regulation, legislation or by the application of standards. In some countries, this will depend on building size, type or by the designation of the space inside the building.

In the UK, the standards that will define the application areas for cables are BS 7671 and BS 6701.The future contents of BS 6701 and BS 7671 are now becoming clear and this document provides guidance in relation to the management of the commercial impact of the CPR.

Key dates

The full implementation of the Construction Products Regulation in relation to cables takes place on 1st July 2017.

BS 7671 (18th Edition) will be published in July 2018 and will coexist with the 17th Edition until 1st January 2019.

a) until the 18th edition is published there will be no automatic direction of where to install energy cables of a given EuroClass;
b) the 18th Edition will defer to BS 6701 for the direction of where to install telecommunications (information technology) cables, whether optical fibre or metallic, of a given EuroClass;
c) however, in the current, 17th, Edition of BS 7671, Regulation 110.1.3 states that for telecommunications systems the requirements of BS 7671 are supplemented by those of BS 6701.

BS 6701 Amendment 1 will be published in October/November 2017. It is being amended to empower the reference proposed in bullet b) above from the 18th Edition.

This means that the EuroClass direction for telecommunications cables within BS 6701 will precede the reference to BS 6701 from BS 7671.

Why is any of this important?

BS 7671 is the de-facto "tool" of the health and safety aspects of the Electricity at Work Act and the Building Regulations. If a safety-related issue is raised in legal proceedings the natural course of action is to determine what the requirements of BS 7671 were at the time the installation was undertaken and to then investigate whether the installation met those requirements or whether an equivalent action was undertaken by the installer. If not, then the situation becomes serious.

As the existing BS 7671 refers to the supplementary requirements of BS 6701 for telecommunications systems in general then whatever the status of BS 6701 is at a given moment is essentially part of BS 7671 and forms the relevant safety requirement or recommendation.

Therefore, as soon as BS 6701 is amended to include requirements regarding EuroClass and their defined installation conditions, BS 7671 automatically includes, implicitly, those requirements - even though BS 7671 has not yet updated its requirements.

As a result we need to be aware of the proposed contents of the amendment of BS 6701 and how it will affect installations commercially.

What do we expect BS 6701 Amendment 1:2017 to state?

Irrelevant of where the cables are installed BS 6701 states that, for new installations and the refurbishment or extension of existing installations, cables installed in the spaces bounded by the external fire barriers of buildings and other structures shall meet the following requirements:

- installation cables shall, as a minimum, meet the requirements of EuroClass C_{ca}-s1b,d2,a2;
- all other cables shall as a minimum meet either:
  - the requirements of EuroClass E_{ca} ;

  or
  - recommended requirements of BS EN 60332-1-2.

Installation cables are specifically mentioned here and 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"*". The purpose of this is to discriminate between cables installed (as jumpers or cords) that can be easily removed in the effect of fire from those that are difficult to remove - irrelevant of whether or not they were installed as cables and then terminated or a pre-terminated cables (e.g. multi-fibre trunk cables).

The requirements for **other cables** desreves some explanation:

- cables which are specifically designated as not suitable for the production of installation cables (e.g. jumpers) can avoid CPR conformance but are required to meet the minimum recommended requirements of BS EN 60332-1-2 - this matches the minimum requirement for cables inside buildings in accordance with BS EN 50174 series standards.
- cables which are not implemented as installation cables (i.e. they are NOT installed in pathways which are hidden and are accessible) may have been subject to CPR classification and in this circumstance they shall meet or exceed EuroClass E_{ca} (which maps to the minimum recommended requirements of BS EN 60332-1-2).

And finally:

> "The installation of cables **penetrating the external fire barrier of buildings** shall conform to the **BS EN 50174 series of standards**."

The requirements of BS EN 50174 series are being updated to state as follows:

> "Upon entering buildings, information technology cables that do not meet the requirements of EuroClass E_{ca} in accordance with EN 13501-6 or others than do not comply with the minimum recommended performance requirements of EN 60332-1-2 shall be either be:
>
> i) terminated inside the building, within 2 m (unless an alternative distance is specified by local regulations) of the point of internal penetration of the external fire barrier or any length exceeding 2 m is installed within trunking or conduit that is considered as a fire barrier in accordance with local fire regulations;
>
> or
>
> ii) terminated inside the building, within 2 m (unless an alternative distance is specified by local regulations) of the point of internal penetration of the external fire barrier or any length exceeding 2 m is installed within trunking or conduit that is considered as a fire barrier in accordance with local fire regulations.
>
> NOTE This also applies where the cable has to pass through a space between two external fire barriers within a building."

And for elsewhere in the building to say

> "Information technology cables that do not meet the requirements of EuroClass E_{ca} in accordance with EN 13501-6 or others that do not comply with the minimum recommended performance requirements of EN 60332-1-2 shall be installed within trunking or conduit that is considered as a fire barrier in accordance with local fire regulations."

So, **to summarise** BS 6701 requires **all installation cables** be **EuroClass C_{ca}-s1b,d2,a2**. This is the UK position which builds upon, but does not conflict with BS EN 50174 standards.

What do we expect BS 7671, 18th Edition, to state?

We expect to find that the requirement for installers will be to apply BS 6701 for telecommunications cables - although energy cables may be differently specified.

What is the commercial impact of BS 6701 Amendment 1:2017

EuroClass Class E_{ca} cables meet the requirements of BS EN 50174-1 and BS EN 50174-2 (which are mandated from the existing BS 6701) when implemented in CPR terms and have costs in line with current market rates.

The final text of BS 6701 Amendment 1:2017 specifies EuroClass C_{ca} so we have a situation that when compared to the current in-building requirement of the "minimum recommended requirements" of BS EN 60332-1-2 ((which is equivalent to E_{ca}) the new cables will probably be more expensive. It is thought for example that UTP cables may increase in price by as much as 20%.

How to handle this possible cost impact

Between now and the date of publication of BS 6701 Amendment 1:2017

- Check if any tenders you are submitting or have submitted for work after 1st July 2017 specify the application of BS 7671 or BS 6701. If they do you are unaffected by what you might install since neither standard references EuroClasses.

After the publication of BS 6701 Amendment 1:2017

- Check all tenders you have submitted before the publication of BS 6701 Amendment 1. If the installation contract specifies the application of BS 7671 or BS 6701, then it could be argued that the your submission was relevant to the contents of BS 6701 at the time the tender was submitted - as opposed to BS 6701 Amendment 1.
- Offer the client the option of complying with Amendment 1 (with any attendant cost increase) or meeting the requirements of BS 6701 at the time of tendering.

- For all tenders being submitted, check if the installation contract specifies the application of BS 7671 or BS 6701. If it does, then the requirements of BS 6701 Amendment 1 would apply. If you are concerned about the price of compliant cable then offer the client two options:
  1. cable in accordance with BS 6701 Amendment 1;
  or
  2. cable in accordance with EuroClass E_{ca}, which does not meet the requirement of BS 6701 Amendment 1.

- Even if an installation contract does not specify the application of BS 7671 or BS 6701, it is an implicit requirement inside buildings. Failure to draw the attention of the client to this is unprofessional and cannot be countenanced. The client should be offered the two options
  1. cable in accordance with BS 6701 Amendment 1;
  or
  2. cable in accordance with EuroClass E_{ca}, which does not meet the requirement of BS 6701 Amendment 1.

It is important to explain that BS 6701 is one of the standards referenced by BS 7671 (irrelevant of CPR) which is the tool of the Electricity at Work Act and the relevant part of the Building Regulations. The client should make the decision - and not the installer. The installer should not assume responsibility for the safety of the cabling in the building.

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Bibliography

BS 6701: Telecommunications equipment and telecommunications cabling - Specification for installation, operation and maintenance

BS 7671: Requirements for Electrical Installations - IET Wiring Regulations

BS EN 50174-1: Information technology - Cabling installation - Part 1: Installation specification and quality assurance

BS EN 50174-2: Information technology - Cabling installation - Part 2: Installation planning and practices inside buildings

BS EN 50174-3: Information technology - Cabling installation - Part 3: Installation planning and practices outside buildings

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Annex A: Brief explanation of the Construction Products Regulation and cables

This document refers to EuroClasses for the specification of the "reaction to fire" performance of cables in accordance with EN 13501-6. EN 13501-6 defines seven basic EuroClasses A_{ca}, $B1_{ca}$, $B2_{ca}$, C_{ca}, D_{ca}, E_{ca} and F_{ca} which are hierarchical by reference to the measured results when cables are subject to a range of fire performance tests.

These "base standard" tests are specifically EN 60332-1-2, EN 50399 and EN ISO 1716.

EuroClass A_{ca} comprises cables that "do not burn" - characterised by a low gross heat of combustion when tested in accordance with EN ISO 1716. Cable meeting this requirement (such as those comprising uncovered mineral-insulated conductors) should not be confused with those that maintain some level of performance when subject to fire conditions. This latter is termed "resistance to fire" and not "reaction to fire".

Of the remainder of cables, EuroClasses $B1_{ca}$, $B2_{ca}$, C_{ca} and D_{ca} are assessed against progressively lower requirements when tested in accordance with EN 50399.

EuroClass E_{ca} cables meet the minimum recommended requirement of EN 60332-1-2 while EuroClass F_{ca} applies to cables that fail to meet the requirements of EuroClass E_{ca}.

Additionally, EuroClasses $B1_{ca}$, $B2_{ca}$, C_{ca} and D_{ca} require the inclusion of sub-classifications relating to the generation of smoke (s), flaming droplets (d) and acid gases (a) which are based on the results other tests according to EN 61034-2, EN 50399 and EN 50267-2-3 respectively. This leads to a EuroClass format of

$$X_{ca}\text{-}s_m\text{-}d_n\text{-}a_p \text{ or } X_{ca}\text{-}s_{m,}\ d_n,\ a_p$$

where X is the EuroClass ranging from A to F as detailed above, s relates to smoke generation (where m = 1, 1a, 1b, 2 or 3), d is for droplets (where n = 0, 1 or 2) and a is acid gas release (where p = 1, 2 or 3). In all cases a lower number/designation for s, d and a represents the best performance.

This is summarised in Table F.1.

Table F.1 – EuroClass designations and their foundation standards

<table>
<tr><th rowspan="2">EuroClass</th><th rowspan="2">Reaction to fire</th><th colspan="3">Additional classifications and parameters</th></tr>
<tr><th>Smoke production</th><th>Flaming droplets</th><th>Acidity</th></tr>
<tr><td>A_{ca}</td><td>Gross heat of combustion [EN ISO 1716]</td><td colspan="3">None</td></tr>
<tr><td>$B1_{ca}$</td><td rowspan="3">Heat release [EN 50399]
Flame spread [EN 50399 and EN 60332-1-2]</td><td rowspan="3">s1a, s1b, s2, s3 [EN 50399/ EN 61034-2]</td><td rowspan="3">d0, d1, d2 [EN 50399/ EN 60754-2]</td><td rowspan="3">a1, a2, a3 [EN 50399/ EN 60754-2]</td></tr>
<tr><td>$B2_{ca}$</td></tr>
<tr><td>C_{ca}</td></tr>
<tr><td>D_{ca}</td><td>Heat release [EN 50399] Flame spread [EN 60332-1-2]</td></tr>
<tr><td>E_{ca}</td><td>Flame spread [EN 60332-1-2]</td><td colspan="3">None</td></tr>
<tr><td>F_{ca}</td><td colspan="4">Fails to meet E_{ca}</td></tr>
</table>