

Fire performance of cables — the CPR and its application

Mike Gilmore, e-Ready Building Limited

Mike Gilmore

Fire performance
 of cables
 –
 the CPR
 and its application



Mike Gilmore, FIET
Managing Director
e-Ready Building Limited

Mobile:
 +44 (0)786 011 0563
 e-mail:
 mike.gilmore
 @
 e-readybuilding.com
 FIA e-mail:
standards@fia-online.co.uk

Standards Activities



Member
JTC1 SC25 WG3: "Generic Cabling"



Leader
WG3 Cabling Implementation Task Group: ISO/IEC 14763-2
Meeting Secretary
WG3 Automated Infrastructure Management Ad-hoc: ISO/IEC 18598



Chairman
TC215



Electrotechnical Aspects of Telecommunication Equipment
Convenor
TC215 WG1: Cabling design
Meeting Secretary
TC215 WG2: Cabling installation - QA and installation practices
Member
TC215 WG3: Facilities and infrastructures (data centres)

Member

CEN/CLC/ETSI CG Green Data Centres



Past-Chairman
TCT/7: Telecommunications - Installation Requirements



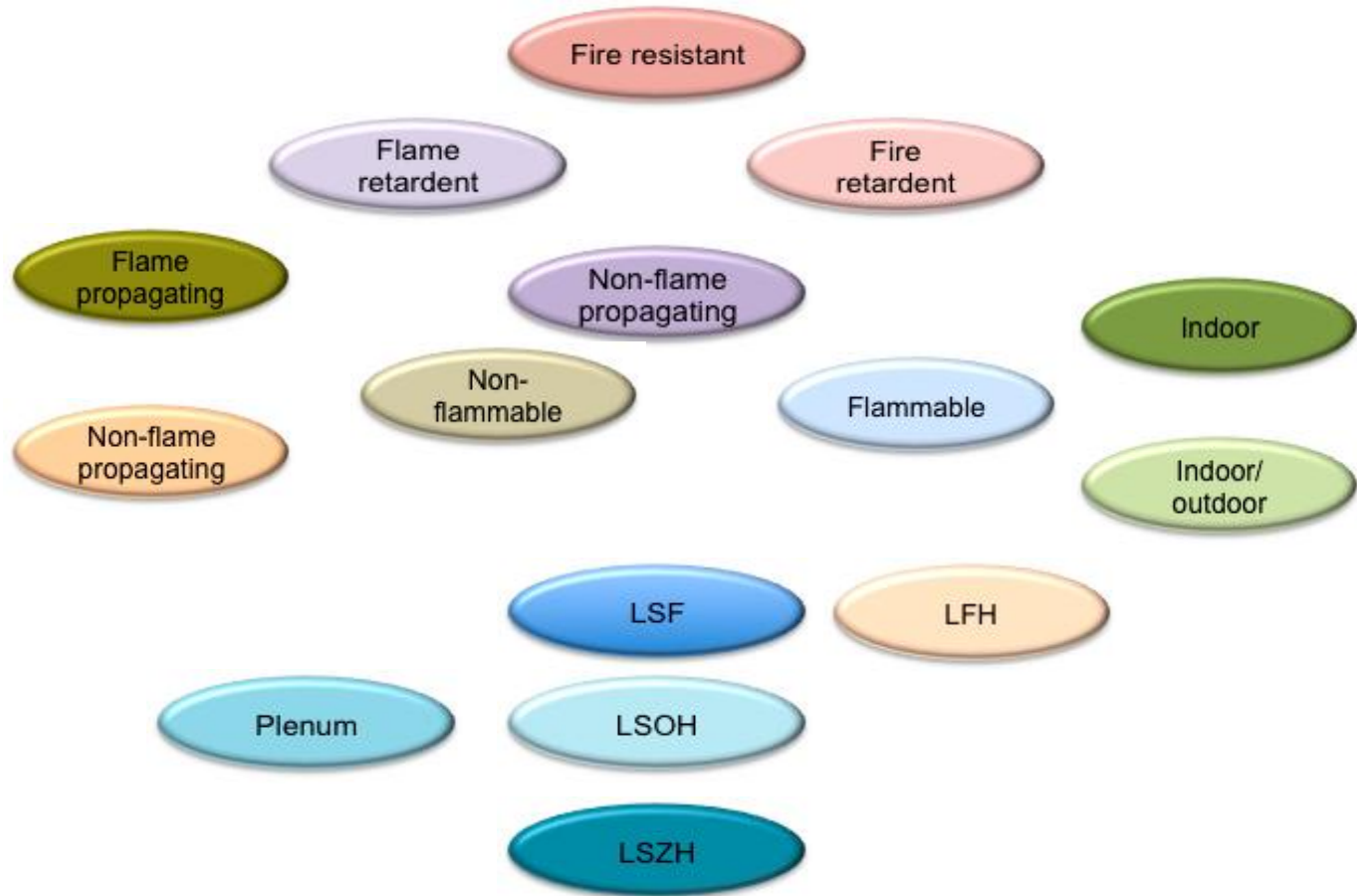
Chairman
TCT/7/1: Cabling: Infrastructure design, planning and commissioning
Meeting Secretary
TCT/7/2: Cabling; Installation and UK implementation
TCT/7/3: Facilities and infrastructures

Fibreoptic Industry Association
www.fia-online.co.uk

Director
standards@fia

Old Terms

Fire performance
of cables
–
the CPR
and its application



New Terms

Fire performance
of cables
–
the CPR
and its application

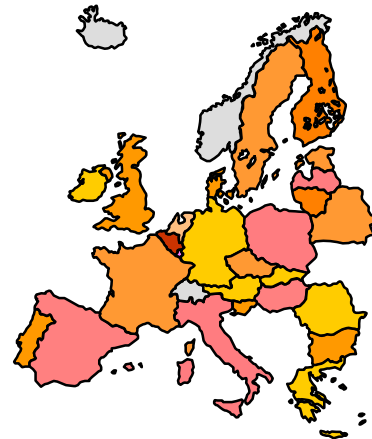
EuroClass	Reaction to fire	Additional classifications and parameters		
		Smoke production	Flaming droplets	Acidity
A _{ca}	Gross heat of combustion [EN ISO 1716]	None		
B1 _{ca}	Heat release [EN 50399] Flame spread [EN 50399 and EN 60332-1-2]	s1a s1b s2 s3 [EN 50399/ EN 61034-2]	d0 d1 d2 [EN 50399/ EN 60754-2]	a1 a2 a3 [EN 50399/ EN 60754-2]
B2 _{ca}				
C _{ca}				
D _{ca}	Heat release [EN 50399] Flame spread [EN 60332-1-2]			
E _{ca}	Flame spread [EN 60332-1-2]	None		
F _{ca}	Fails to meet E _{ca}			



The System

Fire performance of cables
–
the CPR
and its application

REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT
AND OF THE COUNCIL
of 9 March 2011 laying down harmonised conditions for the marketing of construction products and
repealing Council Directive 89/106/EEC
(Text with EEA relevance)



'construction product' means any product or kit which is produced and **placed on the market** for incorporation in a permanent manner in construction works or parts thereof and the performance of which has an effect on the performance of the construction works with respect to the basic requirements for construction works

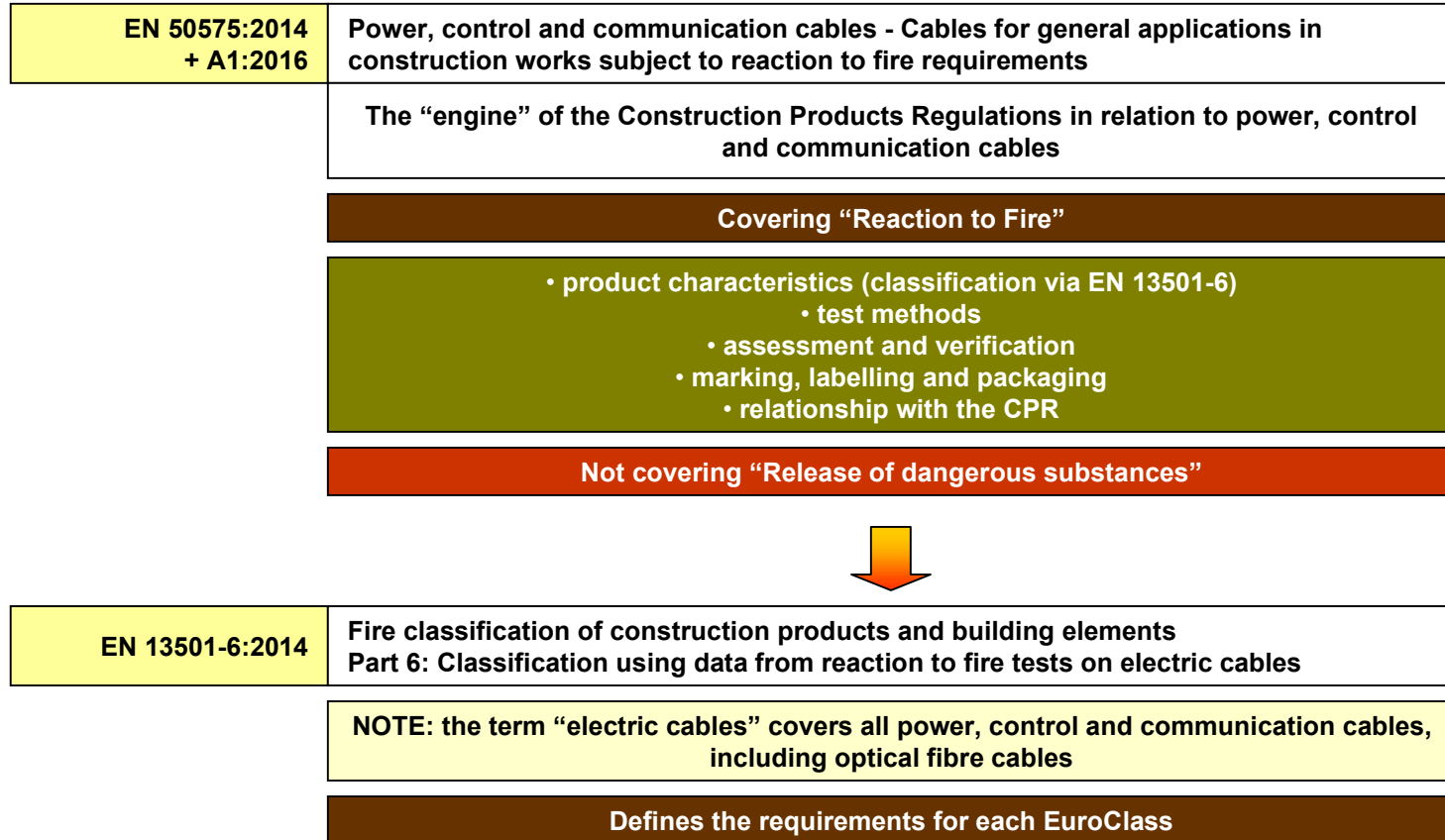
'kit' means a construction product placed on the market by a single manufacturer as a set of at least two separate components that need to be put together to be incorporated in the construction works

'construction works' means buildings and civil engineering works

The product standard EN 50575 for power, control and communication cables was cited in the Official Journal of the European Union on 10th July - scheduling the start of the application of the CPR to these products on 1st December 2015

The Driving Standards

Fire performance
of cables
–
the CPR
and its application



In Scope of CPR

Fire performance
of cables
–
the CPR
and its application

electric cable

all power, control and communication cables, including optical fibre cables and hybrid cables which are a combination of two or more of these cable types

power cable

assembly comprising one or more insulated conductor(s), together with any coverings and protective layers, used for the transmission or supply of electrical energy

control cable

assembly comprising insulated conductors, together with any coverings and protective layers, used for the transmission of control, measuring and indication signals in electric installations

communication cable

assembly of suitably insulated coaxial conductors or twisted pairs of insulated conductors fabricated to meet transmission, mechanical and environmental requirements, and sufficient to allow conveyance of information between two points with the minimum of radiation

optical fibre cable

assembly comprising one or more optical fibres or fibre bundles inside **a common covering designed to protect them against mechanical stresses and other environmental influences** while retaining the transmission quality of the fibres

Out of Scope of CPR

Fire performance
of cables
–
the CPR
and its application

ords

.... any length and for any purpose are not subject to the CPR, cannot be issued with a DoP and cannot be marked.

However, the cable used to create them can be.

Only cable specifically designated with an intended use of non-permanent installation can avoid CPR compliance.

optical fibres and optical fibre bundles

.... placed on the market in that form for installation by blowing or pulling into tubes (often called microducts) are not considered to be cables in accordance with the definition detailed above if they **do not have a structure to protect them against mechanical stresses and other environmental influences** without accommodation within that tube.

For this reason, they do not fall under the scope of the CPR and cannot, legally, be subject to the marking, labelling, DoP and the designation in accordance with EN 50575.

However, if they are placed on the market within a tube then the combination of tube and optical fibres/bundles are acting as a cable and are within scope of the CPR (as would be a conventional loose tube optical fibre cable).

Out of Scope of CPR

Fire performance
of cables
–
the CPR
and its application

“circuit integrity” cables

... required to only provide function in the event of fire (i.e. fire alarm cables)
are excluded from EN 50575

BUT

if they are placed on the market with a combination function
(i.e. act also as telecommunications cables) then they are within scope

cable management systems

CMS are not covered by any harmonised standard under the CPR and are therefore cannot be
designated with a EuroClass

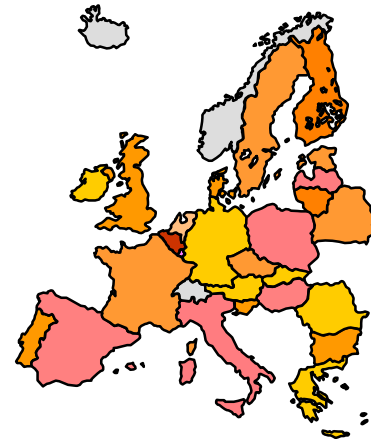
Within the standards for CMS, reaction to fire performance is simply differentiated by the terms
“flame propagating” or “non-flame propagating”

It should be highlighted that “non-flame propagating” does not mean “does not propagate flame”

Application

Fire performance
of cables
–
the CPR
and its application

**REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT
AND OF THE COUNCIL
of 9 March 2011 laying down harmonised conditions for the marketing of construction products and
repealing Council Directive 89/106/EEC**



**CPR DOES NOT TELL YOU WHERE TO USE
PRODUCTS OF A GIVEN EUROCLASS**

Article 8.3 of the CPR states

“...the **CE marking** shall be the **only marking** which attests conformity of the construction product with the declared performance in relation to the **essential characteristics**”

AND

“ ... Member States shall not introduce any references or shall withdraw any references in national measures to a marking attesting conformity with the declared performance in relation to the essential characteristics covered by a harmonised standard other than the CE marking.

EN 50174-x

Fire performance
of cables
–
the CPR
and its application

EN 50174-1, EN 50174-2 and EN 50174-3

Information technology - Cabling installation

Upon entering buildings, telecommunications cables within the spaces bounded by the external fire barriers of buildings or other structure that:

- do not comply with the national or local fire regulations;
 - do not meet the requirements of EuroClass E_{ca}
- or
- do not meet the minimum recommended performance requirements of EN 60332-1-2

shall be either:

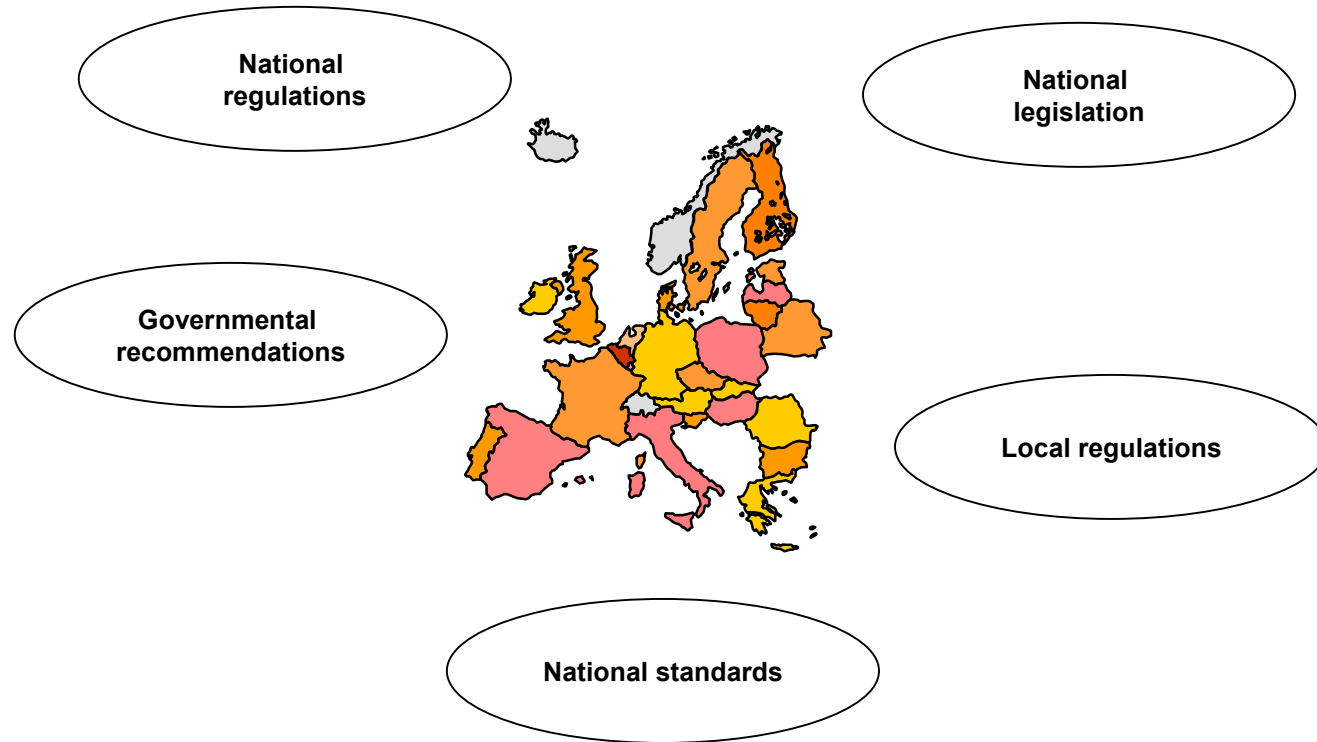
- i) terminated in an entrance facility which is outside the external fire barrier of the building;
- or
- ii) terminated inside the building, within 2 m (unless an alternative distance is specified by local regulations) of the point of internal penetration of the external fire barrier or any length exceeding 2 m is installed within a cable management system that is considered as a fire barrier in accordance with local fire regulations.

Within the spaces bounded by the external fire barriers of buildings or other structure, telecommunications cables shall be installed within a cable management system that is considered as a fire barrier in accordance with local fire regulations where the telecommunications cables:

- do not comply with the national or local fire regulations;
 - do not meet the requirements of EuroClass E_{ca}
- or
- do not meet the minimum recommended performance requirements of EN 60332-1-2.

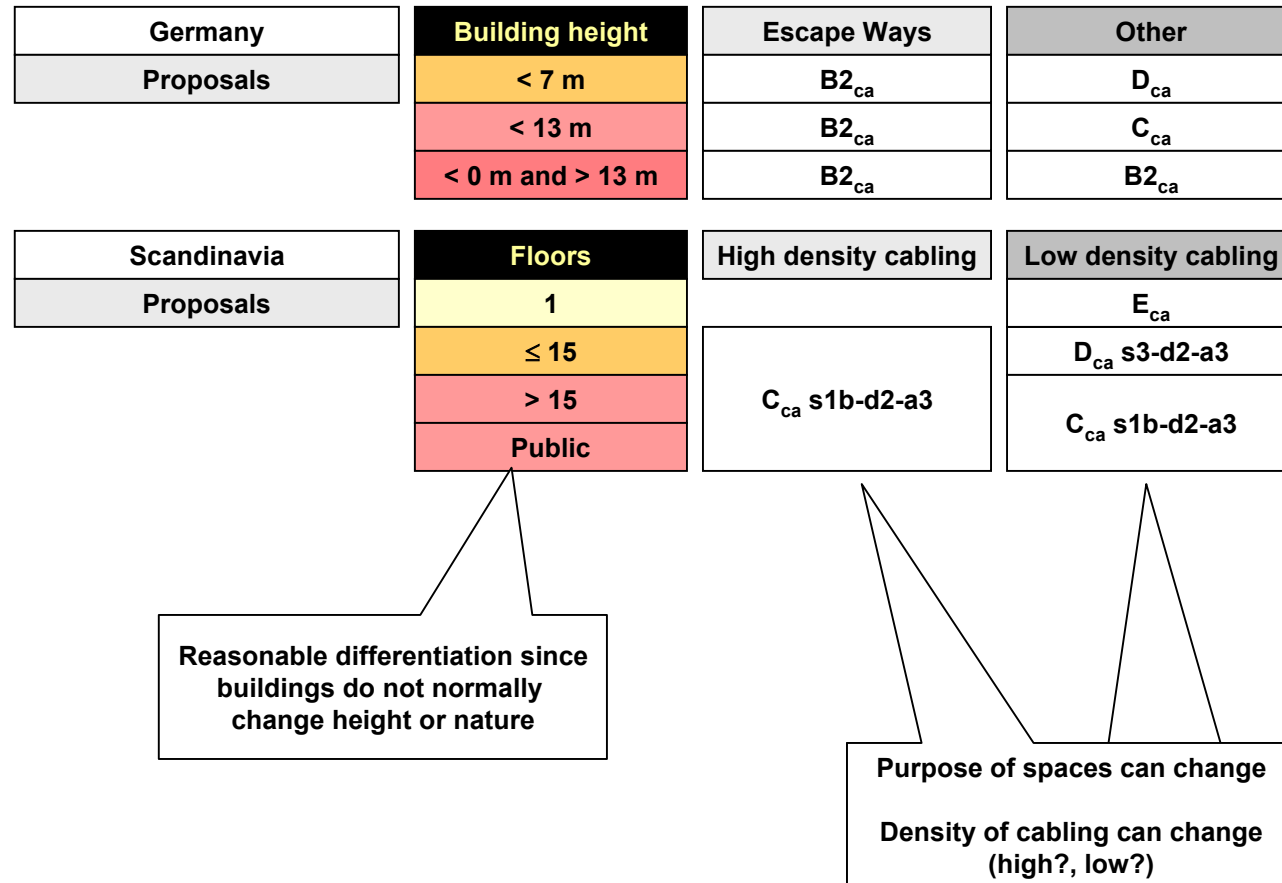
National Implementation

Fire performance of cables
–
the CPR
and its application



The "Space-Specific" Approach

Fire performance
of cables
–
the CPR
and its application



The “Risk-based” Approach

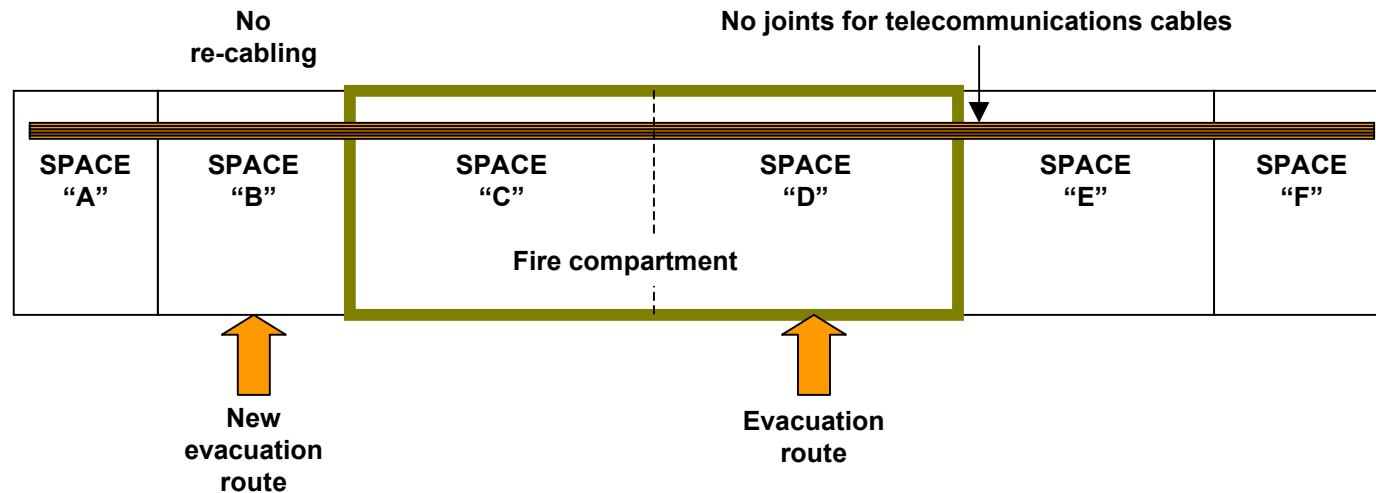
Fire performance of cables
–
the CPR
and its application

Netherlands	Fire risk	
Proposals	Low	E_{ca}
	Medium	D_{ca} s3-d2-a3
	High	C_{ca} s1-d1-a1
	Very high	$B2_{ca}$ s1-d1-a1

Purpose of spaces can change
Fire risk can change

The Universal Approach

Fire performance
 of cables
 –
 the CPR
 and its application



TELECOMMUNICATIONS CABLES HAVE TO MEET THE REQUIREMENTS OF THE MOST DEMANDING SPACE

BRITISH APPROACH - BS 6701:2016 IN A1:2017

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
 - the requirements of EuroClass E_{ca} or
 - the recommended requirements of EN 60332-1-2.

Summary

Fire performance
of cables
–
the CPR
and its application

EUROCLASS DESIGNATIONS FOR CABLE

Provide much-needed clarity to “reaction to fire” performance

affects suppliers:

- testing by Notified Bodies (in most cases) to obtain a Certificate of Conformance (CoC)
- providing Declarations of Performance (DoP)

SEVEN KEY FACTS ABOUT CPR

1	CPR requires certain cables to be certified in terms of their “reaction to fire” - it DOES NOT specify where cables can be used
2	These cables are designated in terms of Class (or EuroClass), supported by a DoP traceable to a CoC and marked or labelled with the CE mark
3	Optical fibres and bundles of optical fibres that are not installable without additional mechanical and environmental protection are NOT within scope of CPR
4	CPR as defined by EN 50575 does not apply to “circuit integrity” cables which are required to function when subjected to fire e.g. fire alarm cables
5	Cords are NOT within scope of CPR - but the cables they are constructed from may be
6	Cable management systems are NOT within scope of CPR - this includes conduit (and blown fibre microduct), trunking, ducting and tray
7	Cables and cable management systems may be CE marked to show their conformance with the Low Voltage Directive

Close

Fire performance
of cables
—
the CPR
and its application

Fire performance of cables
—
the CPR and its application

Mike Gilmore, e-Ready Building Limited