

WHITE PAPER

CONSTRUCTION PRODUCTS REGULATION: CLEAR LABELLING OF CABLE FIRE SAFETY CLASSES

For the first time, in accordance with the European Construction Products Regulation, energy, control and communications cables intended for permanent installation in structures must be tested and classified to new EN standards. From 1 July 2017 only cables with classified fire behaviour may be put on the European market. Cables with system circuit integrity are not currently affected by the Regulation.

Safety objectives in the event of fire are clearly defined in many European countries: the spread of fire and smoke must be prevented and it must be possible to rescue humans and animals. As a matter of principle, therefore, the use of “easily inflammable” building products is prohibited in all classes of building.

Smoke fumes represent the greatest risk in the event of a fire. Most people killed in a fire die from smoke poisoning. The less smoke generated, the higher are the chances of rescue. This is why modern cables feature minimal to low smoke generation. By reducing corrosiveness (acidity) of the flue gases to a minimum, e.g. in halogen-free cables, fire damage and down times after a fire are significantly reduced. Another important aspect is to produce as few flaming droplets as possible, which can reduce fire propagation in horizontal cable systems.

The European Construction Products Regulation

The new European Construction Products Regulation has been in force since July 2013. Its full name is “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.”

For the first time at European level this Regulation stipulates that cables and lines – and this includes data cables – must be classified and marketed as construction products in terms



of fire safety. Requirements governing use are to be regulated nationally in the Member States.

The fire behaviour of cables

Standard cables installed in buildings have at least passed an inflammability test. In the language of the new European construction product classification they display “acceptable fire behaviour”, which would be consistent with Class E_{ca}. Modern cables, however, are capable of far more. They show significantly lower fire propagation in the bundle fire test.

Classified fire behaviour

EN 13501-6 “Fire classification of construction products and building elements, Part 6: Classification using data from reaction to fire tests on electric cables” means that for the first time cables can be classified comparably with other building products.

Euro Class	Test procedure	Classification criteria	Additional requirements
A _{ca}	EN ISO 1716	PCS ≤ 2,0 MJ/kg	
B1 _{ca}	EN 50399 (30 kW burner) THR _{1200s} ≤ 10MJ and FIGRA ≤ 120 Ws ⁻¹	FS ≤ 1.75 m and flaming droplets / particles Peak HRR ≤ 20 kW and	smoke production and acidity
	EN 60332-1-2	H ≤ 425 mm	
B2 _{ca}	EN 50399 (20,5 kW burner) THR _{1200s} ≤ 15 MJ and FIGRA ≤ 150 Ws ⁻¹	FS ≤ 1.5 m and flaming droplets / particles Peak HRR ≤ 30 kW and	smoke production and acidity
	EN 60332-1-2	H ≤ 425 mm	
C _{ca}	EN 50399 (20,5 kW burner) THR _{1200s} ≤ 30 MJ and FIGRA ≤ 300 Ws ⁻¹	FS ≤ 2.0 m und flaming droplets / particles Peak HRR ≤ 60 kW and	smoke production and acidity
	EN 60332-1-2	H ≤ 425 mm	
D _{ca}	EN 50399 (20,5 kW burner) THR _{1200s} ≤ 70 MJ and FIGRA ≤ 1300 Ws ⁻¹	flaming droplets / particles Peak HRR ≤ 400 kW and	smoke production and acidity
	EN 60332-1-2	H ≤ 425 mm	
E _{ca}	EN 60332-1-2	H ≤ 425 mm	
F _{ca}	does not fulfil Euro Class E _{ca}		

THR = Total Heat Release FIGRA = Fire Growth Rate FS = Flame Spread HRR = maximum Heat Release Rate
Source: SN EN 50399 and SN EN 13501-6

The classification table of the new Construction Products Regulation includes seven main classes from A to F. These are assigned on the basis of heat release and flame propagation criteria (see Table 1). A further fire behaviour classification is made for the additional requirements of smoke production (s), flaming droplets or particles (d) and acidity of combustion gases (a) (see Table 2).

Declarations of performance for each product

Since July 2016 the requisite standards for the classification of fire behaviour have been officially applicable and the European test laboratories are accredited to test cables and assign the new European classes. In the transition phase to 1 July 2017 both cables with a declaration of performance which certifies the main class and additional classes assigned and cables which meet current fire behaviour requirements can be put on the market. As of the effective date, 1 July 2017, only cables tested and classified in accordance with the new standards can be marketed.

New national application standards

The selection and use of classified cables should be incorporated in national fire safety regulations and adapted to national safety levels. Now, however, consideration is given to a whole building, beyond pure escape routes. The risks are also assessed according to type and use of building. These are essentially as follows:

- low occupancy and difficult evacuation, e.g. high-rise buildings
- high occupancy and simple evacuation, e.g. theatres, cinemas, department stores
- high occupancy and difficult evacuation, e.g. hotels, hospitals, high-rise buildings with public access

Table 1: New Euro Classes, test procedures and classification criteria

As until now requirements relating to the use of cables differed in Member States, it is hardly surprising that so far suggestions for the choice of main and additional classifications have also varied widely.

International Standard IEC 60364-4-42 specifies cables which are non-flame propagating for escape routes in buildings with special fire risks as well as for premises or places where irreplaceable goods are endangered (e.g. museums, stations, data centres). This standard further recommends halogen-free cables with minimum smoke production (with improved fire safety properties) for premises or places in which irreplaceable cultural assets are present.

Further action

It is advisable for building owners, planners and installers to contact the authorities responsible for fire safety in their country to find out what the situation is with regard to the

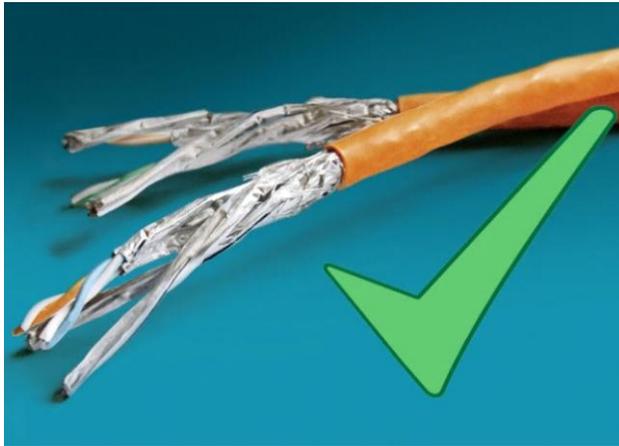
 tested according to EN 50399 classified according to EN 13501-6			
s (smoke)	Peak SPR max. value of smoke produc.	Transmission factor tested according to EN 61034-2	TSP _{1200s} total smoke production
s1	≤ 0.25 m ² /s		≤ 50 m ²
s1a	≤ 0.25 m ² /s	≥ 80%	≤ 50 m ²
s1b	≤ 0.25 m ² /s	≥ 60% < 80%	≤ 50 m ²
s2	≤ 1.5 m ² /s		≤ 400 m ²
s3	neither s1 nor s2		

SPR = Peak Smoke Production Rate TSP = Total Smoke Production

 tested according to EN 50399 classified according to EN 13501-6	
d (droplets)	flaming droplets / particles during 1200 seconds
d0	without
d1	with - but no longer than 10 seconds
d3	neither d0 nor d1

 tested according to EN 60754-2 classified according to EN 13501-6		
a (acidity)	Conductance (μS/mm)	Acid value (pH)
a1	< 2.5	> 4.3
a2	< 10	> 4.3
a3	neither a1 nor a2	
not stated	= no performance determined	

Table 2: The three additional requirements: smoke production, flaming droplets or particles and acidity of combustion gases



national fire safety classification of cables permanently installed in structures. Inasmuch as no mandatory classifications have been established, the authorities should clarify when a decision can be expected and for how long the cables currently available on the market can continue to be used for future planning and installation.

Favourable position for data cables

In the case of data cables little change is required to achieve the new classification requirements - making the adoption of the new regulations an easy transition for clients.

Datwyler will be happy to answer any questions you may have on this subject.