



**COMMISSION DELEGATED REGULATION (EU) 2026/557**

**of 16 March 2026**

**supplementing Regulation (EU) 2024/3110 of the European Parliament and of the Council by  
determining classes of performance in relation to the essential characteristic resistance to fire**

**(Text with EEA relevance)**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) 2024/3110 of the European Parliament and of the Council of 27 November 2024 laying down harmonised rules for the marketing of construction products and repealing Regulation (EU) No 305/2011 <sup>(1)</sup>, and in particular Article 5(5), third subparagraph thereof,

Whereas:

- (1) In order to enable manufacturers to declare sufficiently detailed classes of performance of products within the harmonised zone established pursuant to Article 11 of Regulation (EU) 2024/3110, it is necessary to establish classes of performance that are aligned to the latest technological and market developments.
- (2) Classes of performance as regards the essential characteristic resistance to fire were established by Commission Delegated Regulation (EU) 2024/1681 <sup>(2)</sup> on the basis of Regulation (EU) No 305/2011 of the European Parliament and of the Council <sup>(3)</sup>. However, those classes of performance are not applicable under Regulation (EU) 2024/3110. Therefore, in order to keep the continuity of the system, the CPR Acquis Expert Group advised the Commission to establish the same classes of performance set out by Delegated Regulation (EU) 2024/1681.
- (3) The Commission should therefore determine the classes of performance to be used for the declaration of the essential characteristic resistance to fire,

HAS ADOPTED THIS REGULATION:

*Article 1*

The classes of performance in relation to the essential characteristic resistance to fire of products shall be those set out in the Annex.

<sup>(1)</sup> OJ L, 2024/3110, 18.12.2024, ELI: <http://data.europa.eu/eli/reg/2024/3110/oj>.

<sup>(2)</sup> Commission Delegated Regulation (EU) 2024/1681 of 6 March 2024 supplementing Regulation (EU) No 305/2011 of the European Parliament and of the Council by establishing classes of performance in relation to the resistance to fire of construction products (OJ L, 2024/1681, 13.6.2024, ELI: [http://data.europa.eu/eli/reg\\_del/2024/1681/oj](http://data.europa.eu/eli/reg_del/2024/1681/oj)).

<sup>(3)</sup> 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 (OJ L 88, 4.4.2011, p. 5, ELI: <http://data.europa.eu/eli/reg/2011/305/oj>).

*Article 2*

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 16 March 2026.

*For the Commission*  
*The President*  
Ursula VON DER LEYEN

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## ANNEX

## A. SYMBOLS

For the purposes of this Annex, the following symbols apply:

|      |                                                                                       |                  |
|------|---------------------------------------------------------------------------------------|------------------|
| R    | Load-bearing capacity                                                                 |                  |
| E    | Integrity                                                                             |                  |
| I    | Insulation                                                                            |                  |
| W    | Radiation                                                                             |                  |
| M    | Mechanical action                                                                     |                  |
| C    | Self-closing                                                                          |                  |
| C0-5 | Durability of self-closing:                                                           |                  |
|      | Use category (C)                                                                      | Number of cycles |
|      | 5                                                                                     | ≥ 200 000        |
|      | 4                                                                                     | ≥ 100 000        |
|      | 3                                                                                     | ≥ 50 000         |
|      | 2                                                                                     | ≥ 10 000         |
|      | 1                                                                                     | ≥ 500            |
|      | 0                                                                                     | ≥ 1              |
| S    | Smoke leakage (in context of ventilation systems)/Smoke control (in context of doors) |                  |
| P    | Continuity of power and signal supply under the standard time temperature curve       |                  |
| PH   | Continuity of power and signal supply under constant temperature                      |                  |
| G/O  | Soot fire resistance                                                                  |                  |
| K    | Fire protection ability                                                               |                  |
| T    | Temperature class expressed in maximum gas temperature in °C (operating temperature)  |                  |
| D    | Stability duration under constant temperature                                         |                  |
| DH   | Stability duration under the standard time-temperature curve                          |                  |
| F    | Functionality of powered smoke and heat ventilators                                   |                  |
| B    | Functionality of natural smoke and heat ventilators                                   |                  |

## B. CLASSES OF PERFORMANCE IN RELATION TO THE ESSENTIAL CHARACTERISTIC RESISTANCE TO FIRE OF PRODUCTS

**General**

The relevant definitions, tests and performance criteria are fully described or referenced in the relevant harmonised technical specifications, European assessment documents, and European resistance to fire classification and testing standards.

If for asymmetrical elements the declared class of the element is only valid from one side, this information is provided.

The following classes of performance are expressed in minutes unless otherwise specified:

### 1. Load-bearing elements without a fire-separating function

Table 1

| Applies to | Walls, floors, raised floors, roofs, beams, columns, balconies, walkways and stairs |    |    |    |    |    |    |     |     |     |     |
|------------|-------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| R          |                                                                                     | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |

### 2. Load-bearing elements with a fire-separating function

Table 2.1

| Applies to | Walls |    |    |    |    |    |    |     |     |     |     |
|------------|-------|----|----|----|----|----|----|-----|-----|-----|-----|
| RE         |       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| REI        |       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| REI-M      |       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| REW        |       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |

Table 2.2

| Applies to | Floors, roofs, roof windows, rooflights and shutters                                                                                                                                                                                                                                                                                             |    |    |    |    |    |    |     |     |     |     |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| RE         |                                                                                                                                                                                                                                                                                                                                                  | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| REI        |                                                                                                                                                                                                                                                                                                                                                  | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| C          | The C classification may be declared where a self-closing device is fitted, and the element or product was not manually closed for the purpose of the test.<br>Optionally, for durability of self-closing, the C classification may be complemented by the digits 0 to 5 according to the use category where cycle testing has been carried out. |    |    |    |    |    |    |     |     |     |     |

Table 2.3

| Applies to | Raised floors                                                                                                                                                                                                                                                                                                                                                                                                                                                     |    |    |    |    |    |    |     |     |     |     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| RE         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| REI        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | The classification is made specific depending on the exposure. The absence of the designation letter 'r' refers to standard temperature/time curve exposure (full fire resistance) whereas its presence refers to the constant temperature attack of 500 °C (reduced exposure).<br>Raised floors satisfying the standard temperature/time curve exposure for a given time are considered to satisfy the reduced exposure conditions for at least the same period. |    |    |    |    |    |    |     |     |     |     |

### 3. Products and systems for protecting load-bearing elements

Table 3.1

|                                                                                                                                                                |                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Applies to                                                                                                                                                     | Ceilings with no independent fire resistance                                                                             |
| Assessment of the contribution to the fire resistance of structural members: Expressed in terms of classification of the load-bearing element being protected. |                                                                                                                          |
| Notes                                                                                                                                                          | Where the criteria with regard to the 'semi-natural' fire are satisfied, the symbol 'sn' is added to the classification. |

Table 3.2

| Applies to                                                                                                                                                     | Fire protective coatings (reactive), boards (slabs and mats), renderings (sprays), claddings and screens                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Assessment of the contribution to the fire resistance of structural members: Expressed in terms of classification of the load-bearing element being protected. |                                                                                                                                        |
| Notes                                                                                                                                                          | For coatings, if satisfying the criteria with regard to the 'slow heating' curve, the symbol 'IncSlow' is added to the classification. |

#### 4. Non-loadbearing elements or products with a fire-separating function

Table 4.1

| Applies to | Partitions (including partitions incorporating uninsulated portions) and fixed windows |    |    |    |    |    |    |     |     |     |     |
|------------|----------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                        | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                        | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI-M       |                                                                                        | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EW         |                                                                                        | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |

Table 4.2

| Applies to | Unloaded roofs |    |    |    |    |    |    |     |     |     |     |
|------------|----------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EW         |                | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |

Table 4.3

| Applies to | Cavity barriers                                                                                                                  |    |    |    |    |    |    |     |     |     |     |
|------------|----------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                  | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                  | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | The classification is completed by a separate indication, if the product satisfies the sudden exposure test for cavity barriers. |    |    |    |    |    |    |     |     |     |     |

Table 4.4

| Applies to | Ceilings with independent fire resistance                                                                                                                     |    |    |    |    |    |    |     |     |     |     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| EI         |                                                                                                                                                               | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | The classification is completed by indicating how the element has been tested, and refers to a fire from above '(a→b)' or from below '(b→a)' or both '(a↔b)'. |    |    |    |    |    |    |     |     |     |     |

Table 4.5

| Applies to | Facades (curtain walls) and external walls (including glazed elements)                                                                                                                                                                                                                                                                                  |    |    |    |    |    |    |     |     |     |     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EW         |                                                                                                                                                                                                                                                                                                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | <p>The classification is completed by '(i→o)'; '(o→i)'; or '(i↔o)' to indicate whether the element has been tested and fulfils the requirements from the inside only; from the outside only; or from both sides respectively.</p> <p>The addition of the suffix 'ef' indicates that the test was performed on the basis of the external fire curve.</p> |    |    |    |    |    |    |     |     |     |     |

Table 4.6

| Applies to | Non-mechanical fire barriers for ventilation ductwork                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |    |    |    |    |    |    |     |     |     |     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | <p>In addition to meeting the requirements related to integrity (E), the non-mechanical fire barrier must also:</p> <p>(a) be tested from both sides; and</p> <p>(b) achieve 360 m<sup>3</sup>/(m<sup>2</sup>h) maximum leakage rate with reference to nominal duct cross-sectional area during the fire test.</p> <p>There is no S classification for this product, as it has no ambient temperature smoke performance.</p> <p>'ve' and/or 'ho' indicate that the product is intended to be used for vertical and/or horizontal use.</p> |    |    |    |    |    |    |     |     |     |     |

Table 4.7

| Applies to | Penetration seals                                                                                                                                                                                                                                                                                                                                                                                     |    |    |    |    |    |    |     |     |     |     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                                                                                                                                       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                                                                                                                                       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | <p>The classification is expressed in terms of classification of the supporting construction with fire-separating function being penetrated.</p> <p>The classification of pipe penetration seals is completed by the addition of 'U/U', 'C/U', 'U/C', or 'C/C' depending on the tested pipe end configuration inside the furnace and outside the furnace respectively (U – uncapped; C – capped).</p> |    |    |    |    |    |    |     |     |     |     |

Table 4.8

| Applies to | Combined penetration seals                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                     | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                     | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | <p>The classification is expressed in terms of classification of the supporting construction with fire-separating function being penetrated.</p> <p>The classification is completed with the additional relevant classifications of combined elements as set out in this Annex.</p> |    |    |    |    |    |    |     |     |     |     |

Table 4.9

| Applies to | Linear joint seals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |    |    |    |    |    |     |     |     |     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | <p>The classification is completed by the addition of the symbols:</p> <ul style="list-style-type: none"> <li>— 'H', or 'V', or 'T' indicating that the classification is valid for the corresponding orientation (Horizontal supporting construction; Vertical supporting construction – vertical joint; Vertical supporting construction – horizontal joint respectively);</li> <li>— 'M', or 'F', or 'B' indicating the type of splices (Manufactured; Field; or Both manufactured and field respectively);</li> <li>— 'X', or 'Mxxx' indicating the movement capability (No movement; or Movement induced (in %) respectively), including the subscript 'lat' or 'shear' indicating the induced movement;</li> <li>— 'W w1 to w2' indicating the joint width range (in mm) for which the classification criterion is satisfied (w1 being the lower width and w2 the higher width limit).</li> </ul> |    |    |    |    |    |    |     |     |     |     |

Table 4.10

| Applies to                         | Fire resisting doorsets, openable windows (in walls and roofs), openable rooflights and shutters (including those that incorporate glazing, closing devices and other building hardware)                                                                                                                                                                                                                                                                                                                                   |    |    |    |    |    |    |     |     |     |     |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EW                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| S <sub>200</sub>                   | For elements and products having passed smoke control criteria depending on test conditions fulfilled.                                                                                                                                                                                                                                                                                                                                                                                                                     |    |    |    |    |    |    |     |     |     |     |
| S <sub>a3</sub> or S <sub>a4</sub> | For elements and products having passed smoke control criteria depending on test conditions fulfilled.                                                                                                                                                                                                                                                                                                                                                                                                                     |    |    |    |    |    |    |     |     |     |     |
| C                                  | <p>The C classification may be declared where a self-closing device is fitted and the element or product was not manually closed for the purpose of the test.</p> <p>Optionally, for durability of self-closing, the C classification may be complemented by the digits 0 to 5 according to the use category where cycle testing has been carried out.</p>                                                                                                                                                                 |    |    |    |    |    |    |     |     |     |     |
| Notes                              | <p>The EI classification is completed by the addition of the suffix '1' or '2' to indicate which definition of insulation is used.</p> <p>In the case where the classification does not cover heating on both the closing and the opening face, it must be indicated explicitly in the classification.</p> <p>This table does not include or address products for smoke ventilation.</p> <p>Additional smoke control classification of large industrial doorsets is possible to a leakage limit of 50 m<sup>3</sup>/h.</p> |    |    |    |    |    |    |     |     |     |     |

Table 4.11

| Applies to | Closures for conveyers and track bound transportation systems |    |    |    |    |    |    |     |     |     |     |
|------------|---------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                               | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                               | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EW         |                                                               | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |

| Applies to | Closures for conveyers and track bound transportation systems                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C          | The C classification may be declared where a self-closing device is fitted and the element or product was not manually closed for the purpose of the test.<br>Optionally, for durability of self-closing, the C classification may be complemented by the digits 0 to 5 according to the use category where cycle testing has been carried out.                                                                                                |
| Notes      | The EI classification is completed by the addition of the suffix '1' or '2' to indicate which definition of insulation is used. An EI classification must be generated in cases where the test specimen is a pipe or duct configuration with no assessment of the closure for the conveyor system.<br>Sustained operational capability of any clearing device and/or any separating device for a conveyor system is identified by using a 'T'. |

Table 4.12

| Applies to | Air transfer grilles                                                                                                                                                                                                                                            |    |    |    |    |    |    |     |     |     |     |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                 | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                 | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EW         |                                                                                                                                                                                                                                                                 | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | If satisfying the criteria with regard to integrity during the open state, the symbol 'resist flame' is added to the classification.<br>If satisfying the criteria with regard to the 'smouldering' curve, the symbol 'IncSlow' is added to the classification. |    |    |    |    |    |    |     |     |     |     |

Table 4.13

| Applies to | Service ducts and shafts                                                                                                                                                                                                                                                              |    |    |    |    |    |    |     |     |     |     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | The classification indicates how the element has been tested and refers to a fire from the inside '(i→o)' or from the outside '(o→i)' or both '(i↔o)'. In addition, the symbols 've' and/or 'ho' indicate that the product is intended to be used for vertical and/or horizontal use. |    |    |    |    |    |    |     |     |     |     |

Table 4.14

| Applies to                      | Chimneys                                                                                                                                                                                                                                                                             |     |     |     |     |     |     |     |     |     |     |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                 | G + distance in mm (e.g. G 50) or O + distance in mm (e.g. O 50)                                                                                                                                                                                                                     |     |     |     |     |     |     |     |     |     |     |
| E                               |                                                                                                                                                                                                                                                                                      | 15  | 20  | 30  | 45  | 60  | 90  | 120 | 180 | 240 | 360 |
| EI                              |                                                                                                                                                                                                                                                                                      | 15  | 20  | 30  | 45  | 60  | 90  | 120 | 180 | 240 | 360 |
| T (operating temperature) in °C | 80                                                                                                                                                                                                                                                                                   | 100 | 120 | 140 | 160 | 200 | 250 | 300 | 400 | 450 | 600 |
| Notes                           | Distance not required for built-in products.<br>The classification indicates how the element has been tested and refers to a fire from the outside '(o→i)' or both '(i↔o)'.<br>'ve' and/or 'ho' indicate that the product is intended to be used for vertical and/or horizontal use. |     |     |     |     |     |     |     |     |     |     |

Table 4.15

| Applies to     | Wall and ceiling coverings                                                                                                       |    |    |    |    |    |    |     |     |     |     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| K <sub>1</sub> | 10                                                                                                                               | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| K <sub>2</sub> | 10                                                                                                                               | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes          | The suffixes '1' and '2' indicate which substrates, fire behaviour criteria and extension rules are used in this classification. |    |    |    |    |    |    |     |     |     |     |

## 5. Products for use in ventilation systems (excluding smoke and heat exhaust ventilation)

Table 5.1

| Applies to | Fire resisting ventilation ducts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    |    |    |    |    |    |     |     |     |     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| S          | 10 m <sup>3</sup> /(m <sup>2</sup> h) maximum leakage rate with reference to the duct surface area during the fire test.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |    |    |    |    |    |    |     |     |     |     |
| Notes      | <p>In addition to meeting the requirements related to integrity (E) the duct must also achieve 15 m<sup>3</sup>/(m<sup>2</sup>h) maximum leakage rate with reference to duct surface area during the fire test.</p> <p>The classification indicates how the element has been tested and refers to a fire from the inside '(i→o)' or from the outside '(o→i)' or both '(i↔o)'.</p> <p>'ve' and/or 'ho' indicate that the product is intended to be used for vertical and/or horizontal use.</p> <p>The classification must indicate the pressure difference used in the test.</p> |    |    |    |    |    |    |     |     |     |     |

Table 5.2

| Applies to | Fire dampers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |    |    |    |    |    |    |     |     |     |     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| S          | 200 m <sup>3</sup> /(m <sup>2</sup> h) maximum leakage rate with reference to nominal duct cross sectional area:<br>(a) smallest size at ambient temperature;<br>(b) largest size at ambient temperature and during the fire test.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |
| Notes      | <p>In addition to meeting the requirements related to integrity (E) the fire damper must also:</p> <p>(a) be tested from both sides; and</p> <p>(b) achieve 360 m<sup>3</sup>/(m<sup>2</sup>h) maximum leakage rate with reference to nominal duct cross sectional area during the fire test.</p> <p>'ve' and/or 'ho' indicate that the product is intended to be used for vertical (for example, wall mounted) and/or horizontal (for example, floor mounted) use.</p> <p>'H' indicates a fire damper capable of satisfying integrity (E), or integrity and insulation (EI) for the classification period having a horizontal blade axis or geometry.</p> <p>'V' indicates a fire damper capable of satisfying integrity (E), or integrity and insulation (EI) for the classification period having a vertical blade axis or geometry.</p> |    |    |    |    |    |    |     |     |     |     |

## 6. Products to be used within electrical, power control and communication building service installations

Table 6.1

| Applies to | Fire protective systems for cable systems and associated components                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |    |    |    |    |    |     |     |     |     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| P          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes      | <p>The classification must indicate:</p> <p>The type of cables which can be installed within the fire protective systems, that is to say any standard cable or only specific cables; and the cables configurations which can be protected and the operating voltage as follows:</p> <ul style="list-style-type: none"> <li>— either to all types of power cables (rated voltage 300/500 V) for an operating voltage up to 230/400 V (three-phase AC);</li> <li>— either to all types of power cables (rated voltage 450/750 V up to 0,6/1 kV) for an operating voltage up to 400/690 V (Three-phase AC);</li> <li>— either to all types of signal-/control cables (rated voltage up to 170 V) for an operating voltage up to 110 V; or</li> <li>— any combination of the above possibilities.</li> </ul> |    |    |    |    |    |    |     |     |     |     |

Table 6.2

| Applies to      | Unprotected electric, power control and communication cables with intrinsic fire resistance                                           |    |    |    |    |    |    |     |     |     |     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| P <sub>ca</sub> |                                                                                                                                       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes           | For power cables and control cables, the classification must indicate for which rated voltage the performance criteria are satisfied. |    |    |    |    |    |    |     |     |     |     |

Table 6.3

| Applies to       | Unprotected small electric, power control and communication cables with intrinsic fire resistance (< 20 mm diameter and with conductor sizes ≤ 2,5 mm <sup>2</sup> ) |    |    |    |    |    |    |     |     |     |     |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| PH <sub>ca</sub> |                                                                                                                                                                      | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes            | For power cables and control cables, the classification must indicate for which rated voltage the performance criteria are satisfied.                                |    |    |    |    |    |    |     |     |     |     |

## 7. Products to be used in smoke and heat control systems

Table 7.1

| Applies to       | Single compartment smoke control ducts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |     |     |     |     |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E <sub>600</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| S                | 5 m <sup>3</sup> /(m <sup>2</sup> h) maximum leakage rate with reference to duct surface area at ambient temperature and 5 m <sup>3</sup> /(m <sup>2</sup> h) maximum leakage rate related to the duct surface area during the fire test.                                                                                                                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |     |     |     |     |
| Notes            | <p>In addition to meeting the requirements related to integrity (E) the duct must also achieve 10 m<sup>3</sup>/(m<sup>2</sup>h) maximum leakage rate with reference to duct surface area during the fire test.</p> <p>The classification is completed by the suffix 'single' for products intended to be used for single compartment use only.</p> <p>'ve' and/or 'ho' indicate that the product is intended to be used for vertical and/or horizontal use, within the compartment.</p> <p>'500', '1 000', '1 500' indicate the product is intended to be used up to these values of under-pressure, measured in Pa at ambient temperature.</p> |    |    |    |    |    |    |     |     |     |     |

Table 7.2

| Applies to | Multi-compartment fire resistant smoke control ducts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |    |    |    |     |     |     |     |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| S          | 5 m <sup>3</sup> /(m <sup>2</sup> h) maximum leakage rate with reference to duct surface area at ambient temperature and 5 m <sup>3</sup> /(m <sup>2</sup> h) maximum leakage rate related to the duct surface area during the fire test.                                                                                                                                                                                                                                                                                                                                                                              |    |    |    |    |    |    |     |     |     |     |
| Notes      | <p>In addition to meeting the requirements related to integrity (E) the duct must also achieve 10 m<sup>3</sup>/(m<sup>2</sup>h) maximum leakage rate with reference to duct surface area during the fire test.</p> <p>The classification is completed by the suffix 'multi' for products intended to be used for multi-compartment use.</p> <p>'ve' and/or 'ho' indicate that the product is intended to be used for vertical and/or horizontal use.</p> <p>'500', '1 000', '1 500' indicate that the product is intended to be used up to these values of under-pressure, measured in Pa at ambient temperature.</p> |    |    |    |    |    |    |     |     |     |     |

Table 7.3

| Applies to       | Single compartment smoke control dampers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |    |    |    |    |    |     |     |     |     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E <sub>600</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| S                | <p>200 m<sup>3</sup>/(m<sup>2</sup>h) maximum leakage rate with reference to nominal duct cross sectional area:</p> <p>(a) smallest size at ambient temperature;</p> <p>(b) largest size at ambient temperature and during the fire test.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |     |     |     |     |
| Notes            | <p>In addition to meeting the requirements related to integrity (E) the single compartment smoke control damper must also:</p> <p>(a) be tested from both sides;</p> <p>(b) pass a maintenance of opening test; and</p> <p>(c) achieve 360 m<sup>3</sup>/(m<sup>2</sup>h) maximum leakage rate with reference to nominal duct cross sectional area during the fire test</p> <p>(1) smallest size at ambient temperature; and</p> <p>(2) largest size at ambient temperature and during the fire test.</p> <p>The classification is completed by the suffix 'single' for products intended for single compartment use.</p> <p>'ved', 'vew', 'vedw' and/or 'hod', 'how', 'hodw' indicate that the product is intended to be used for vertical and/or horizontal use, together with mounting in a duct or in a wall/floor or both respectively.</p> <p>'H' indicates a single compartment smoke control damper capable of satisfying integrity (E) for the classification period having a horizontal blade axis or geometry,</p> <p>'V' indicates a single compartment smoke control damper capable of satisfying integrity (E) for the classification period having a vertical blade axis or geometry.</p> <p>'500', '1 000' and '1 500' indicate that the product is intended to be used up to this value of under-pressure in Pa at ambient temperature.</p> <p>'AA' denotes for use with applications providing automatic activation, 'MA' denotes for use with applications requiring manual intervention or providing automatic activation.</p> <p>'C<sub>300</sub>', 'C<sub>10 000</sub>', 'C<sub>MOD</sub>' or 'C<sub>300(N)</sub>', 'C<sub>10 000(N)</sub>', 'C<sub>MOD(N)</sub>' indicate the product is intended to be used in smoke control only systems, fully controlled smoke control systems and smoke control systems combined with environmental systems or modulating smoke control dampers intended to be used in any system having a controlled or variable position, tested under load, or without load (N), respectively.</p> <p>'HOT 400/30' (High Operational Temperature) indicates that the single compartment smoke control damper has been subjected to an additional test to demonstrate that it has the ability to be opened and closed during a period of 30 minutes of temperatures up to 400 °C.</p> |    |    |    |    |    |    |     |     |     |     |

Table 7.4

| Applies to | Multi-compartment fire resistant smoke control dampers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |    |    |    |    |    |    |     |     |     |     |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| E          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| EI         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| S          | 200 m <sup>3</sup> /(m <sup>2</sup> h) maximum leakage rate with reference to nominal duct cross sectional area:<br>(a) smallest size at ambient temperature;<br>(b) largest size at ambient temperature and during the fire test.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |    |    |    |    |    |    |     |     |     |     |
| Notes      | <p>In addition to meeting the requirements related to integrity (E) or integrity and insulation (EI) the multi-compartment fire resistant smoke control damper must also:</p> <p>(a) be tested from both sides;<br/>           (b) pass a maintenance of opening test; and<br/>           (c) achieve 360 m<sup>3</sup>/(m<sup>2</sup>h) maximum leakage with reference to nominal duct cross sectional area during the fire test</p> <p>(1) smallest size at ambient temperature; and<br/>           (2) largest size at ambient temperature and during the fire test.</p> <p>The classification is completed by the suffix 'multi' for products intended for multi-compartment use. 'ved', 'vew', 'vedw' and/or 'hod', 'how', 'hodw' indicate that the product is intended to be used for vertical and/or horizontal use, together with mounting in a duct or in a wall/floor or both respectively. 'H' indicates a multi-compartment fire resistant smoke control damper capable of satisfying integrity (E), or integrity and insulation (EI) for the classification period having a horizontal blade axis or geometry. 'V' indicates a multi-compartment fire resistant smoke control damper capable of satisfying integrity (E), or integrity and insulation (EI) for the classification period having a vertical blade axis or geometry. '500', '1 000' and '1 500' indicate that the product is intended to be used up to this value of under-pressure in Pa at ambient temperature. 'AA' denotes for use with applications providing automatic activation, 'MA' denotes for use with applications requiring manual intervention or providing automatic activation. 'C<sub>300</sub>', 'C<sub>10 000</sub>', 'C<sub>MOD</sub>' or 'C<sub>300(N)</sub>', 'C<sub>10 000(N)</sub>', 'C<sub>MOD(N)</sub>' indicate that the product is intended to be used in smoke control only systems, fully controlled smoke control systems and smoke control systems combined with environmental systems or modulating smoke control dampers intended to be used in any system having a controlled or variable position, tested under load, or without load (N), respectively. 'HOT 400/30' (High Operational Temperature) indicates that the multi-compartment fire resistant smoke control damper has been subjected to an additional test to demonstrate that it has the ability to be opened and closed during a period of 30 minutes of temperatures up to 400 °C.</p> |    |    |    |    |    |    |     |     |     |     |

Table 7.5

| Applies to       | Smoke barriers |    |    |    |    |    |    |     |     |     |     |
|------------------|----------------|----|----|----|----|----|----|-----|-----|-----|-----|
| D <sub>600</sub> |                | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| DH               |                | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |

Table 7.6

| Applies to       | Powered smoke and heat control ventilators (fans), including connectors |    |    |    |    |    |    |     |     |     |     |
|------------------|-------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| F <sub>200</sub> |                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| F <sub>300</sub> |                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| F <sub>400</sub> |                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| F <sub>600</sub> |                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| F <sub>842</sub> |                                                                         | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |

Table 7.7

| Applies to       | Natural smoke and heat exhaust ventilators                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|
| B <sub>300</sub> |                                                                                                                                                                                     | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| B <sub>600</sub> |                                                                                                                                                                                     | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| B <sub>ϑ</sub>   |                                                                                                                                                                                     | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 180 | 240 | 360 |
| Notes            | Where ϑ indicates the exposure condition (temperature), higher than 300 °C.<br>These products are designed to open in case of fire and do not have an integrity (E) classification. |    |    |    |    |    |    |     |     |     |     |