



Brussels, XXX
[...] (2023) XXX draft

ANNEX

ANNEX

to the

Commission Delegated Regulation (EU) .../...of XXX

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

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
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 resistance to fire of construction products

General

The relevant definitions, tests and performance criteria are fully described or referenced in the European resistance to fire classification standards, harmonised European product standards, European testing standards, and relevant parts of Eurocodes.

If for asymmetrical elements the declared class of the element is only valid from one side, the class shall be accompanied by this information.

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, roofs, beams, columns, balconies, walkways, 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

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	<p>The classification shall be 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).</p> <p>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.</p>										

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	If satisfying the criteria with regard to the 'semi-natural' fire, 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 satisfying 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 shall also:</p> <p>a) be tested from both sides, and</p> <p>b) achieve 360 m³/(m²h) 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" show 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 shall be completed with the additional relevant classifications of combined elements as given 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"> — "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), — "M", or "F", or "B" indicating the type of splices (Manufactured; Field; or Both manufactured and field respectively), — "X"; or "Mxxx" indicating the movement capability (No movement; or Movement induced (in %)) 										

	respectively), including the subscript “lat” or “shear” indicating the induced movement, and — “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).
--	---

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
C	The C classification may be declared where a self-closing device is fitted and the doorset was not manually closed for the purpose of the test. Optionally, for durability of self-closing device, the C classification may be complemented by the digits 0 to 5 according to the intended use 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. In the case the classification does not cover heating on both the closing and the opening face, this shall be made explicit in the classification. For fire-resisting doorsets also having passed smoke control doorsets criteria, the classification can be completed with the S _a and/or S ₂₀₀ classes.										

Table 4.11

Applies to	Smoke control doorsets, openable windows (in walls and roofs), openable rooflights and shutters (including those that incorporate glazing, closing devices and other building hardware)										
S ₂₀₀	Depending on test conditions fulfilled.										
S _a	Depending on test conditions fulfilled.										
C	The C classification may be declared where a self-closing device is fitted and the doorset was not manually closed for the purpose of the test. Optionally, for durability of self-closing device, the C classification may be complemented by the digits 0 to 5 according to the intended use where cycle testing has been carried out.										
Notes	This table does not include or address products for smoke ventilation. For smoke control doorsets also having passed fire-resisting doorsets criteria, the classification can be completed with the relevant E, EI ₁ /EI ₂ , or EW classes. Additional smoke control classification of large industrial doorsets is possible to a leakage limit of 50 m ³ /h.										

Table 4.12

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
C	The C classification may be declared where a self-closing device is fitted and the closures for conveyers and track bound transportation system was not manually closed for the purpose of the test. Optionally, for durability of self-closing device, the C classification may be complemented by the digits 0 to 5 according to the intended use 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 shall be generated for those cases where the test specimen is a pipe or duct configuration with no assessment of the closure for the conveyor system.										

	Sustained operational capability of any clearing device and/or any separating device for a conveyor system is identified by using a “T”.
--	--

Table 4.13

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	<p>If satisfying the criteria with regard to integrity during the open state, the symbol 'resist flame' is added to the classification.</p> <p>If satisfying the criteria with regard to the 'smoldering' curve, the symbol 'IncSlow' is added to the classification.</p>										

Table 4.14

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	<p>The classification defines 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' show the product is intended to be used for vertical and/or horizontal use.</p>										

Table 4.15

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	<p>Distance not required for built-in products.</p> <p>The classification defines how the element has been tested and refers to a fire from the outside '(o→i)' or both '(i ↔ o)'. 've' and/or 'ho' show the product is intended to be used for vertical and/or horizontal use.</p>										

Table 4.16

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

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 ³ /(m ² 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 m³/(m²h) maximum leakage rate with reference to duct surface area during the fire test.</p> <p>The classification defines 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' show the product is intended to be used for vertical and/or horizontal use.</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	<p>200 m³/(m²h) 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 fire damper shall also:</p> <p>a) be tested from both sides, and</p> <p>b) achieve 360 m³/(m²h) maximum leakage rate with reference to nominal duct cross sectional area during the fire test.</p> <p>'ve' and/or 'ho' show the product is intended to be used for vertical and/or horizontal 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 shall indicate:</p> <p>The type of cables which can be installed within the fire protective systems, i.e. any standard cable or only specific cables; and</p> <p>the cables configurations which can be protected and the operating voltage, i.e;</p> <ul style="list-style-type: none"> — either to all types of power cables (rated voltage 300/500 V) for an operating voltage up to 230/400 V (three-phase AC); — 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); — either to all types of signal-/control cables (rated voltage up to 170 V) for an operating voltage up to 110 V; — or any combination of the above possibilities. 										

Table 6.2

Applies to	Unprotected electric, power control and communication cables with intrinsic fire resistance										
P _{ca}		15	20	30	45	60	90	120	180	240	360

Notes	For power cables and control cables the classification shall 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 mm²)										
PH _{ca}		15	20	30	45	60	90	120	180	240	360
Notes	For power cables and control cables the classification shall 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 ₆₀₀		15	20	30	45	60	90	120	180	240	360
S	10 m ³ /(m ² h) maximum leakage rate with reference to duct surface area at ambient temperature and 5 m ³ /(m ² 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 m³/(m²h) 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' show the product is intended to be used for vertical and/or horizontal use, within the compartment.</p> <p>'500', '1 000', '1 500' show 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	10 m ³ /(m ² h) maximum leakage rate with reference to duct surface area at ambient temperature and 5 m ³ /(m ² 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 m³/(m²h) 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' show the product is intended to be used for vertical and/or horizontal use.</p> <p>'500', '1 000', '1 500' show 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 ₆₀₀		15	20	30	45	60	90	120	180	240	360
S	<p>200 m³/(m²h) 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 shall also:</p> <ul style="list-style-type: none"> a) be tested from both sides, b) pass a maintenance of opening test, and c) achieve $360 \text{ m}^3/(\text{m}^2\text{h})$ maximum leakage rate with reference to nominal duct cross sectional area during the fire test <ul style="list-style-type: none"> 1) smallest size at ambient temperature, and 2) largest size at ambient temperature and during the fire test. <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' show 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', '1000' and '1500' show 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>'C₃₀₀', 'C₁₀₀₀', 'C_{MOD}' or 'C_{300(N)}', 'C_{1000(N)}', 'C_{MOD(N)}' show 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	<p>$200 \text{ m}^3/(\text{m}^2\text{h})$ maximum leakage rate with reference to nominal duct cross sectional area:</p> <ul style="list-style-type: none"> a) smallest size at ambient temperature; 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 shall also:</p> <ul style="list-style-type: none"> a) be tested from both sides, b) pass a maintenance of opening test, and c) achieve $360 \text{ m}^3/(\text{m}^2\text{h})$ maximum leakage with reference to nominal duct cross sectional area during the fire test <ul style="list-style-type: none"> 1) smallest size at ambient temperature, and 2) largest size at ambient temperature and during the fire test. <p>The classification is completed by the suffix 'multi' for products intended for multi-compartment use.</p> <p>'ved', 'vew', 'vedw' and/or 'hod', 'how', 'hodw' show 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 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,</p> <p>"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.</p> <p>'500', '1000' and '1500' show 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>										

‘C₃₀₀’, C₁₀₀₀₀’, ‘C_{MOD}’ or ‘C_{300(N)}’, C_{10000(N)}’, ‘C_{MOD(N)}’ show 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.

Table 7.5

Applies to	Smoke barriers										
D ₆₀₀		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 ₂₀₀		15	20	30	45	60	90	120	180	240	360
F ₃₀₀		15	20	30	45	60	90	120	180	240	360
F ₄₀₀		15	20	30	45	60	90	120	180	240	360
F ₆₀₀		15	20	30	45	60	90	120	180	240	360
F ₈₄₂		15	20	30	45	60	90	120	180	240	360

Table 7.7

Applies to	Natural smoke and heat exhaust ventilators										
B ₃₀₀		15	20	30	45	60	90	120	180	240	360
B ₆₀₀		15	20	30	45	60	90	120	180	240	360
B ₀		15	20	30	45	60	90	120	180	240	360
Notes	Where θ indicates the exposure condition (temperature), higher than 300 °C. These products are designed to open in case of fire and do not have an integrity (E) classification.										