

Euro-Fire EF1 Upgrade – European Tests / Classification for walls and ceiling linings

Overview:

Below are the European Reaction to Fire test Standards followed within the classification, which include the conditioning procedures and general rules for selection of substrates and the Classification standard for wall and ceiling linings:

EN 13238:2010: Reaction to fire tests for building products. Conditioning procedures and general rules for selection of substrates.

EN 13823:2010 + A1:2014: Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item.

EN ISO 11925-2:2010: Reaction to fire tests - Ignitability of building products subjected to direct impingement of flame - Part 2: Single-flame source test.

EN 13501-1:2007 + A1:2009: Fire classification of construction products and building elements. Classification using test data from reaction to fire tests

In order to obtain "B", "C" or "D" classification, EN ISO 11925-2 and EN 13823 standards must be performed. The results obtained will designate the classification, depending on the criteria specified in EN 13501-1.

Summary:

Taking into consideration the information described above, ISF Group Ltd selected "FIMAPAN" particle board as a standard substrate to perform the different fire tests according to the Euroclasses. This substrate fulfils the different conditions which appear in the standard EN 13238 to be a standard substrate highlighted in the table "List of standard substrates for wall and ceiling surface products" and "Rules applying to standard substrates for wall and ceiling surface products".

"FIMAPAN" particle board is a non-fire retardant treated board with a thickness of 12 mm, a density of 710kg/m³, and classified as D-s2,d0 (verified compliance within the EN 13238 standard).

Moreover, according to what the standard specifies, this standard substrate (particle board) represents wooden substrates with a density greater than 510kg/m³ and any substrate classified as A1 and A2-s1, d0.

If the classification should be obtained through tests carried out on a support that does not meet the conditions described above, it will only be valid for the specific tested support.

Clarification:

ISF Group Ltd have not **FORMALLY** tested the **EUROFIRE EF1 UPGRADE** process on any other substrates different from the "FIMAPAN" particle board as this is specified as a **TESTING STANDARD**, and represents wooden substrates with a density equal too or greater than 510kg/m³ and any substrate classified as A1 and A2-s1.

Due to the varied products on the market that require flame retardant coating, we would always recommend that you should seek clarification from your Architect and Fire officer **IN WRITING BEFORE** commencing any job that the certification issued will suffice, independent testing on non standard substrates such as Veneered MDF, Etc. would be advised.

ISF Group Ltd will not be responsible for any remedial costs incurred on any Project that has not received this written confirmation prior to commencement.

The relevant tables and lists referenced above are shown over the next following pages:

Regards

Phil Atkinson

Technical Manager
ISF Group Ltd

TABLE 1 : CLASSES OF REACTION TO FIRE PERFORMANCE FOR CONSTRUCTION PRODUCTS EXCLUDING FLOORINGS

Class	Test method(s)	Classification criteria	Additional classification
A1	prEN ISO 1182 ⁽¹⁾ ; And	$\Delta T \leq 30^{\circ}\text{C}$; and $\Delta m \leq 50\%$; and $t_f = 0$ (i.e. no sustained flaming)	-
	prEN ISO 1716	$\text{PCS} \leq 2,0 \text{ MJ/kg}$ ⁽¹⁾ and $\text{PCS} \leq 2,0 \text{ MJ/kg}$ ⁽²⁾ ^(2a) and $\text{PCS} \leq 1,4 \text{ MJ/m}^2$ ⁽³⁾ and $\text{PCS} \leq 2,0 \text{ MJ/kg}$ ⁽⁴⁾	-
A2	prEN ISO 1182 ⁽¹⁾ ; or	$\Delta T \leq 50^{\circ}\text{C}$; and $\Delta m \leq 50\%$; and $t_f \leq 20\text{s}$	-
	prEN ISO 1716; and	$\text{PCS} \leq 3,0 \text{ MJ/kg}$ ⁽¹⁾ and $\text{PCS} \leq 4,0 \text{ MJ/m}^2$ ⁽²⁾ and $\text{PCS} \leq 4,0 \text{ MJ/m}^2$ ⁽³⁾ and $\text{PCS} \leq 3,0 \text{ MJ/kg}$ ⁽⁴⁾	-
	EN 13823	$\text{FIGRA} \leq 120 \text{ W/s}$; and $\text{LFS} < \text{edge of specimen}$; and $\text{THR}_{600\text{s}} \leq 7,5 \text{ MJ}$	Smoke production ⁽⁵⁾ ; and Flaming droplets/particles ⁽⁶⁾
B	EN 13823 and	$\text{FIGRA} \leq 120 \text{ W/s}$; and $\text{LFS} < \text{edge of specimen}$; and $\text{THR}_{600\text{s}} \leq 7,5 \text{ MJ}$	Smoke production ⁽⁵⁾ ; and Flaming droplets/particles ⁽⁶⁾
	prEN ISO 11925-2 ⁽⁸⁾ ; Exposure = 30s	$F_s \leq 150\text{mm}$ within 60s	
C	EN 13823; and	$\text{FIGRA} \leq 250 \text{ W/s}$; and $\text{LFS} < \text{edge of specimen}$; and $\text{THR}_{600\text{s}} \leq 15 \text{ MJ}$	Smoke production ⁽⁵⁾ ; and Flaming droplets/particles ⁽⁶⁾
	prEN ISO 11925-2 ⁽⁸⁾ ; Exposure = 30s	$F_s \leq 150\text{mm}$ within 60s	
D	EN 13823; and	$\text{FIGRA} \leq 750 \text{ W/s}$	Smoke production ⁽⁵⁾ ; and Flaming droplets/particles ⁽⁶⁾
	prEN ISO 11925-2 ⁽⁸⁾ ; Exposure = 30s	$F_s \leq 150\text{mm}$ within 60s	
E	prEN ISO 11925-2 ⁽⁸⁾ ; Exposure = 15s	$F_s \leq 150\text{mm}$ within 20s	Flaming droplets/particles
F	No performance determined		
⁽¹⁾ For homogeneous products and substantial components of non-homogeneous products ⁽²⁾ For any external non-substantial component of non-homogeneous products ^(2a) Alternatively, any external non-substantial component having a $\text{PCS} \leq 2,0 \text{ MJ/m}^2$, provided that the product satisfies the following criteria of EN 13823, $\text{FIGRA} \leq 20 \text{ W/s}$, and $\text{LFS} < \text{edge of specimen}$, and $\text{THR}_{600\text{s}} \leq 4,0 \text{ MJ}$, and s1, and d0 ⁽³⁾ For any internal non-substantial component of non-homogeneous products ⁽⁴⁾ For the product as a whole ⁽⁵⁾ s1 = $\text{SMOGRA} \leq 30\text{m}^2/\text{s}^2$ and $\text{TSP}_{600\text{s}} \leq 50\text{m}^2$; s2 = $\text{SMOGRA} \leq 180\text{m}^2/\text{s}^2$ and $\text{TSP}_{600\text{s}} \leq 200\text{m}^2$; s3 = not s1 or s2 ⁽⁶⁾ d0 = No flaming droplets/ particles in En 13823 within 600s; d1 = No flaming droplets/ particles persisting longer than 10s in EN13823 within 600s; d2 = not d0 or d1; Ignition of the paper in prEN ISO 11925-2 results in a d2 classification ⁽⁷⁾ Pass = no ignition of the paper (no classification); Fail = ignition of the paper (d2 classification) ⁽⁸⁾ Under conditions of surface flame attack and, if appropriate to the end-use application of the product, edge flame attack.			

Note: "A1" and "A2" can only be achieved by products that are non-combustible ("A1") or of limited combustibility ("A2").

List of Standard Substrates for Wall and Ceiling Surface Products.

Nature of Substrate	Nominal Density (kg/m ³)	Thickness (mm)	Euroclass	Rules Applying as listed in 5.3 of EN 13238 : 2010
Fibre cement board (see ISO 390)	1800 ±200	8 ± 1	A2-s1-d0	5.3.2.1 5.3.2.2 5.3.2.7 5.3.2.10
Calcium silicate board	870 ±50	11 ± 2	A2-s1-d0	5.3.2.1 5.3.2.2 5.3.2.7 5.3.2.10
Rock fibre mineral wool slab, mass loss less than 3% at 550°C (ISO 1887)	50 ±20	25 ± 5	A1	5.3.2.1 5.3.2.2 5.3.2.7 5.3.2.10
Steel sheet	7850 ±50	0.8 ± 0.2	A1	5.3.2.1 5.3.2.2 5.3.2.5 5.3.2.7 5.3.2.10
Aluminium sheet	2700 ±50	1.0 ± 0.2	A1	5.3.2.1 5.3.2.2 5.3.2.6 5.3.2.7 5.3.2.10
Paper faced plasterboard (see prEN 520)	700 ±100	12.5 ± 0.5	A2-s1-d0	5.3.2.1 5.3.2.2 5.3.2.4 5.3.2.7 5.3.2.10
Particle board – not fire retardant treated, for internal use (see EN 312-2)	680 ±50	12 ± 2	D-s2-d0	5.3.2.1 5.3.2.3 5.3.2.7 5.3.2.10
Plywood not fire retardant treated (EN 636)	450 ± 50	9 ± 1	D-s2-d0	5.3.2.1 5.3.2.3 5.3.2.7 5.3.2.10

Rules Applying to Standard Substrates for Wall and Ceiling Surface Products

- 5.3.2.1 Each standard substrate represents end-use substrates which have a density of at least 75% of the nominal value of the density of that standard substrate.
- 5.3.2.2 Standard substrates of Euroclasses A1 and A2-s1-d0 represent end-use substrates of Euroclasses A1 and A2-s1-d0 only.
- 5.3.2.3 The standard particleboard substrate represents and the standard plywood substrate represents end-use wood based substrates and also any end-use substrates of Euroclasses A1 and A2-s1-d0.
- 5.3.2.4 The standard gypsum plasterboard substrate is representative of end-use gypsum plasterboard substrates and also any end-use substrates of Euroclasses A1 and A2-s1-d0. The standard calcium silicate substrate is not representative of a gypsum plasterboard end-use substrate.
- 5.3.2.5 The standard steel sheet substrate is only representative of end use metal substrates with a melting point equal to or greater than 1000°C.
- 5.3.2.6 The standard aluminium sheet substrate is only representative of metal substrates with a melting point equal to or greater than 500°C.
- 5.3.2.7 Where in the end-use of a surface product an air gap is incorporated, this shall be reproduced as part of the test specimens up to a maximum depth of 25mm, unless a higher value is specified in the applicable test standard.
- 5.3.2.8 For a surface product, where there are layers behind the immediate substrate which can influence the performance of the product, e.g. an insulating material behind a painted steel sheet, the surface product together with its immediate substrate and the additional layers shall be representative of the end-use application and shall be included in the test specimens.
- 5.3.2.9 Surface products with end-use substrates not represented by a standard substrate shall be tested in end-use condition.
- 5.3.2.10 The method of attachment (e.g. adhesive) of surface products shall be representative of end-use application.

The method of attachment in end-use practice shall be reproduced in the preparation of the test specimens, i.e. end-use adhesive and end-use quantities etc. If the order in which the attachments are conducted is known, this shall be reproduced in the test specimens, e.g. if in the end use practice the adhesive is applied to the substrate and not the surface product in practice, the adhesive is applied to the substrate and not to the surface of the product then it shall be applied to the substrate during test specimen preparation. The same or greater time for curing and drying as used in end-use practice shall also be allowed.