

EUROPEAN FIRE TESTING

Testing and classification

Harmonisation is in progress throughout the EU under the Construction Products Directive, with the aim of reducing barriers to trade by ensuring that products have been tested and classified consistently for their performance.

Building Regulations for England and Wales control the use of materials for wall and ceiling surfaces, to limit the spread of fire across their surfaces. In the past this has been controlled by classification of surfaces according to performance tests to various parts of BS 476. In the future this system will be replaced by a new Europe-wide system of testing and classification for 'reaction to fire'. This relates to the combustibility and ignitability of a material, ie its potential for contribution to fire growth. Based on new tests, harmonised European classes have been developed for reaction to fire performance and adopted in national regulations of EU member states.

Wall and ceiling surfaces

In England and Wales, the requirements for wall and ceiling surfaces are set out in Building Regulations Approved Document B, section B2 Internal fire spread (linings).

Requirements are expressed as a classification derived from tests. Currently performance can be demonstrated against either the existing National or the new European standards, but over the next few years the European standards will supersede National standards. During the transition period regulations will refer to both sets of standards.

Performance classifications are based on a number of new tests, the most important of which is BS EN 13823: 2002 *Single burning item (SBI) test*. This provides a measure of fire growth rate and smoke growth rate. Based on test results the material is classified according to BS EN 13501-1: 2002: *Fire classification of construction products and building elements: Part 1: Classification using test data from reaction to fire tests*.

Correspondence between previous flame spread classes and the new European classes is shown below. However, it is not possible to claim a European class for a product based on a National test; the European class must be based on the European tests.

Comparison of reaction to fire tests with current standards

Euro class	Germany	France	UK
EN 13501-1	DIN 4102	NFP 92-501	BS 476 pts 6 & 7
A	A	M0	
	A2	M0	Class 0
B	B1	M1	Class 0
C	B1	M1	Class 1
D	B2	M2	Class 1
E	B2	M3	Class 2
F	B3	M3	Class 3

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The new classification also takes account of smoke creation and the creation of flaming particles or droplets which might spread fire but Building Regulations (England and Wales) Approved Document B2 does not currently set any limit for this.

Definition	Grade	Smoke Propagation	Flaming Droplets
Non-Combustible Materials	A1	-	
	A2	s1	d0
and all variations			
Combustible materials: Very limited contribution to fire	B	s1	d0
		and all variations	
Combustible materials: Limited contribution to fire	C	s1	d0
		and all variations	
Combustible materials: Medium contribution to fire	D	s1	d0
		and all variations	
Combustible materials: High contribution to fire	E	E-d2	
Combustible materials: Easily flammable	F		

There are 7 **reaction to fire** classifications levels available:

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The reaction to fire classification determines how much (if any) a material contributes to the spread of flame:

- A1, A2 = Non-Combustible Materials.
- B, C, D = Ranges from very limited to medium contribution to fire.
- E, F = High contribution to fire.

The 's' part relates to total **smoke propagation**, during the first ten minutes of exposure.

These determine a 'smoke' index:

- S1 = a little or no smoke
- S2 = quite a lot of smoke
- S3 = substantial smoke

The 'd' part relates to '**flaming droplets and particles**' during the first 10 minutes of exposure. The index is:

- D0 = none
- D1 = some
- D2 = quite a lot

Building Regulations

Approved Document B *Volume 2 Buildings other than dwelling houses*

B2 Internal fire spread (linings) requires internal linings of walls and ceilings to resist the spread of flame over their surfaces. Linings which were previously required to be either National Class 0 or Class 1 may now alternatively be European Class B-s3, d2 or Class C-s3, d2, if they have achieved these classes under European tests. 's3, d2' means that there is no limit set for production of smoke and/or flaming droplets/particles. Appendix A describes the classes of performance and the methods of test. The National and European classifications do not automatically equate; therefore, a product cannot claim a European class unless it has been tested accordingly.

Regards

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