OFFICE OF THE
DEPUTY PRIME MINISTER

The Building Regulations 2000

Fire safety

B

AMENDMENTS 2002

to Approved Document B (Fire safety)

Coming into effect 1 March 2003

Contents

		PAGE
1.	**Introduction**	2
2.	**Amendments to Approved Document B**	3
	Use of guidance	3
	B1 - Means of warning and escape	5
	B2 - Internal fire spread (linings)	6
	B3 - Internal fire spread (structure)	8
	B4 - External fire spread	10
	Appendix A - Performance of materials and structures	11
	Appendix B - Fire doors	26
	Appendix E - Definitions	29
	Appendix G - Standards referred to	30

1. Introduction

1. Section 2 of this document contains amendments to Approved Document B (Fire safety) 2000 which was previously approved and issued by the Secretary of State under section 6 of the Building Act 1984 for the purpose of providing practical guidance with respect to the requirements of the Building Regulations 2000.

2. In exercise of his powers under section 6 of the Building Act 1984, the Secretary of State has approved Approved Document B 2000, with the amendments set out in section 2 of this document, for the purpose of providing practical guidance with respect to the requirements of the Building Regulations 2000 (as amended).

3. The purpose of the amendments in this document is to provide visible recognition to the new European technical specifications and supporting fire test methods, which have been produced in support of the Construction Products Directive (CPD).

4. Following the issue of this document, it is envisaged that any subsequent reprints of the current edition of Approved Document B will include the amendments set out in this document.

5. The ODPM envisage that further documents such as this will be issued in order to keep the Approved Document up to date.

Building Regulations Division
Office of the Deputy Prime Minister

2. Amendments to Approved Document B

Use of Guidence

Page 6

Add the following text after the existing text:

"The Construction Products Directive

The Construction Products Directive (CPD) is one of the "New Approach" Directives, which seek to remove technical barriers to trade within the European Economic Area (EEA) as part of the move to complete the Single Market. The EEA comprises the European Community and those states in the European Free Trade Association (other than Switzerland). The intention of the CPD is to replace existing national standards and technical approvals with a single set of European-wide technical specifications for construction products (i.e. harmonised European standards or European Technical Approvals). Any manufacturer whose products have CE marking showing that they are specified according to European technical specifications cannot have his products refused entry to EEA markets on technical grounds. In the UK, the CPD was implemented by the Construction Products Regulations, which came into force on 27 December 1991 and were amended on 1 January 1995 by the Construction Products (Amendment) Regulations 1994.

This document refers to, and utilises within its guidance, a large number of British Standards, in relation to Codes of Practice and fire test methods (typically the BS 476 series of documents). In order to facilitate harmonisation and the use of the new technical specifications and their supporting European test standards, guidance is also given on the classification of products in accordance with those standards.

Guidance is given for the appropriate use and/or specification of a product to which one or more of the following apply:

1. a product bearing CE marking in accordance with the Construction Products Directive (89/106/EEC) as amended by the CE marking Directive (93/68/EEC);

2. a product tested and classified in accordance with the European Standards (BS EN) referred to in the Commission Decision 2000/147/EC[1] and/or Commission Decision 2000/367/EC[2];

3. a product complying with an appropriate technical specification (as defined in the Directives 89/106/EC as amended by 93/68/EEC).

The implementation of the Construction Products Directive (CPD) will necessitate a time period during which national (British) Standards and European technical specifications will co-exist. This is the so-called period of co-existence. The objective of this period of co-existence is to provide for a gradual adaptation to the requirements of the CPD. It will enable producers, importers and distributors of construction products to sell stocks of products manufactured in line with the national rules previously in force and have new tests carried out. The duration of the period of co-existence in relation to the European fire tests has not yet been clearly defined.

As new information becomes available and further harmonised European standards relevant to this document are published, further guidance will be made available. For example, further guidance will be necessary in the areas of roof coverings and thermoplastics.

Designation of standards

The designation of "xxxx" is used for the year referred to for standards that are not yet published. The latest version of any standard may be used provided that it continues to address the relevant requirements of the Regulations.

Commission guidance papers and decisions

The following guidance papers and Commission decisions are directly relevant to fire matters under the Construction Products Directive:

Guidance paper G -
The European classification system for the reaction to fire performance of construction products.

Guidance paper J -
Transitional arrangements under the Construction Products Directive.

Commission Decision of 8 February 2000 (2000/147/EC) implementing Council Directive 89/106/EEC as regards the classification of the reaction to fire performance of construction products.

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1 Implementing Council Directive 89/106/EEC as regards the classification of the reaction to fire (2000/147/EC) performance of construction products.

2 Implementing Council Directive 89/106/EEC as regards the classification of the resistance to fire (2000/367/EC) performance of construction products, construction works and parts thereof.

Commission Decision of 3 May 2000 (2000/367/EC) implementing Council Directive 89/106/EEC as regards the classification of the resistance to fire performance of construction products, construction works and parts thereof.

Commission Decision of 26 September 2000 (2000/605/EC) amending Decision 96/603/EC establishing the list of products belonging to Classes A “No contribution to fire” provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products.

Corrigenda – Corrigendum to Commission Decision 2000/147/EC of 8 February 2000 implementing Council Directive 89/106/EEC as regards the classification of the reaction to fire performance of construction products.

The publication and revision of Commission guidance papers and decisions are ongoing and the latest information in this respect can be found by accessing the European Commission’s website via the link on the ODPM web site at: www.odpm.gov.uk/bregs/cpd/index.htm”

Means of warning and escape

Page 18

Paragraph 1.27:
(a) replace existing second paragraph with:

"Call points for electrical alarm systems should comply with BS 5839: Part 2 *Specification for manual call points*, or Type A of BS EN 54 *Fire detection and fire alarm systems - Part 11: Manual call points*, and these should be installed in accordance with BS 5839: Part 1. Type B call points should only be used with the approval of the Building Control Body."

(b) amend **"Note:"** to **"Note 1:"**

(c) add new Note:

"Note 2: BS EN 54-11 covers two types of call points, Type A (direct operation) in which the change to the alarm condition is automatic (i.e. without the need for further manual action) when the frangible element is broken or displaced; and Type B (indirect operation) in which the change to the alarm condition requires a separate manual operation of the operating element by the user after the frangible element is broken or displaced."

B2

Internal fire spread (linings)

Page 55

Replace the requirement with the following:

Requirement	*Limits on application*
Internal fire spread (linings) **B2.**-(1) To inhibit the spread of fire within the building, the internal linings shall – (a) adequately resist the spread of flame over their surfaces; and (b) have, if ignited, either a rate of heat release or a rate of fire growth, which is reasonable in the circumstances. (2) In this paragraph "internal linings" means the materials or products used in lining any partition, wall, ceiling or other internal structure.	

Page 56

Replace the text of the existing "Performance" with:

"In the Secretary of State's view the requirement of B2 will be met if the spread of flame over the internal linings of the building is restricted by making provision for them to have low rates of surface spread of flame, and in some cases to have a low rate of heat release, so as to limit the contribution that the fabric of the building makes to fire growth. In relation to the European fire tests and classification system, the requirement of B2 will be met if the heat released from the internal linings is restricted by making provision for them to have a resistance to ignition and a rate of fire growth which are reasonable in the circumstances.

The extent to which this is necessary is dependent on the location of the lining."

Paragraph B2.i: replace the last paragraph with:

"Several properties of lining materials influence fire spread. These include the ease of ignition and the rate at which the lining material gives off heat when burning. The guidance relating to the European fire tests and classification provides for control of internal fire spread through control of these properties. This document does not give detailed guidance on other properties such as the generation of smoke and fumes."

Paragraph B2.v: replace existing two paragraphs with:

"B2.v Appendix A describes the different classes of performance and the appropriate methods of test (see paragraphs 7-20).

The National classifications used are based on tests in BS 476: Fire tests on building materials and structures, namely Part 6: *Method of test for fire propagation for products* and Part 7: *Method of test to determine the classification of the surface spread of flame of products*. However, Part 4: *Non-combustibility test for materials* and Part 11: *Method for assessing the heat emission from building products* are also used as one method of meeting Class 0. Other tests are available for classification of thermoplastic materials if they do not have the appropriate rating under BS 476 Part 7 and three ratings, referred to as TP(a) rigid and TP(a) flexible and TP(b), are used.

The European classifications are described in BS EN 13501-1:2002, *Fire classification of construction products and building elements,* Part 1-*Classification using data from reaction to fire tests*. They are based on a combination of four European test methods, namely:

BS EN ISO 1182:2002, *Reaction to fire tests for building products – Non combustibility test;*

BS EN ISO 1716:2002, *Reaction to fire tests for building products – Determination of the gross calorific value;*

BS EN 13823:2002, *Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by a single burning item*; and

BS EN ISO 11925-2:2002, *Reaction to fire tests for building products, Part 2-Ignitability when subjected to direct impingement of flame*.

For some building products, there is currently no generally accepted guidance on the appropriate procedure for testing and classification in accordance with the harmonised European fire tests. Until such a time that the appropriate European test and classification methods for these building products are published classification may only be possible using existing national test methods.

Table A8, in Appendix A, gives typical performance ratings which may be achieved by some generic materials and products."

Page 57

Table 10: replace existing table with:

Table 10 Classification of linings

Location	National class (1)	European class (1)(3)(4)
Small rooms (2) of area not more than: a) 4m² in residential accommodation; b) 30m² in non-residential accommodation	3	D-s3, d2
Domestic garages of area not more than 40m²		
Other rooms (2) (including garages)	1	C-s3, d2
Circulation spaces within dwellings		
Other circulation spaces, including the common areas of flats and maisonettes	0	B-s3, d2

Notes:

1 see paragraph B2.v.

2 for meaning of room, see definition in Appendix E.

3 the National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class, unless they have been tested accordingly.

4 when a classification includes "s3, d2", this means that there is no limit set for smoke production and/or flaming droplets/particles.

Paragraph 7.4: replace existing paragraph with:

"7.4 Parts of walls in rooms may be of a poorer performance than specified in paragraph 7.1 (but not poorer than Class 3 (National class) or Class D-s3, d2s3, d2 (European class)) provided the total area of those parts in any one room does not exceed one half of the floor area of the room, subject to a maximum of 20m² in residential accommodation, and 60m² in non-residential accommodation."

Paragraph 7.6: replace existing paragraph with:

"7.6 Cavity barriers are needed in some concealed floor or roof spaces (see Section 10), however this need can be reduced by the use of a fire-resisting ceiling below the cavity. Such a ceiling should comply with Diagram 35."

Paragraph 7.7: add new Note:

"Note: No guidance is currently possible on the performance requirements in the European fire tests as there is no generally accepted test and classification procedure."

Page 58

Paragraph 7.11: replace existing paragraph with:

"7.11 Thermoplastic materials (see Appendix A, paragraph 17) which cannot meet the performance given in Table 10, can nevertheless be used in windows, rooflights and lighting diffusers in suspended ceilings if they comply with the provisions described in paragraphs 7.12 to 7.16 below. Flexible thermoplastic material may be used in panels to form a suspended ceiling if it complies with the guidance in paragraph 7.17. The classifications used in paragraphs 7.12 to 7.17, Table 11 and Diagram 24 are explained in Appendix A, paragraph 20.

Note: No guidance is currently possible on the performance requirements in the European fire tests as there is no generally accepted test and classification procedure."

Internal fire spread (structure)

Page 75

Table 14: replace existing table with:

Table 14 Maximum dimensions of cavities in non-domestic buildings (Purpose Groups 2-7)

Location of cavity	Class of surface/product exposed in cavity (excluding the surface of any pipe, cable or conduit, or any insulation to any pipe)		Maximum dimensions in any direction (m)
	National class	European class	
Between roof and a ceiling	Any	Any	20
Any other cavity	Class 0 or Class 1	Class A1or Class A2-s3, d2 or Class B-s3, d2 or Class C-s3, d2	20
	Not Class 0 or Class 1	Not any of the above classes	10

Notes:

1 Exceptions to these provisions are given in paragraphs 10.11-10.13.

2 The National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class unless they have been tested accordingly.

3 When a classification includes "s3, d2", this means that there is no limit set for smoke production and/or flaming droplets/particles.

Page 77

Paragraph 10.11: replace existing paragraph (g) with:

"g. between double-skinned corrugated or profiled insulated roof sheeting, if the sheeting is a material of limited combustibility and both surfaces of the insulating layer have a surface spread of flame of at least Class 0 or 1 (National class) or Class C-s3, d2 or better (European class) (see Appendix A) and make contact with the inner and outer skins of cladding (see Diagram 36).

Note: When a classification includes "s3, d2", this means that there is no limit set for smoke production and/or flaming droplets/particles."

Paragraph 10.12: replace existing paragraph (b) with:

"b. the surface of the material/product exposed in the cavity being Class 0 or Class 1 (National class) or Class C-s3, d2 or better (European class).

Note: When a classification includes "s3, d2", this means that there is no limit set for smoke production and/or flaming droplets/particles."

Paragraph 10.13: replace existing paragraph (d) with:

"d. the surface of the material/product used in the construction of the ceiling and which is exposed in the cavity is Class 0 (National class) or Class B-s3, d2 or better (European class) and the supports and fixings in the cavity are of non-combustible construction;

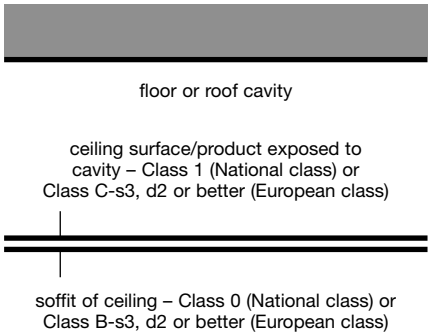
Note: When a classification includes "s3, d2", this means that there is no limit set for smoke production and/or flaming droplets/particles."

Page 78

Diagram 35: replace existing diagram with:

Diagram 35 **Fire-resisting ceiling below concealed space**

See paragraph 10.11(c) and Table 13 Note 3



Notes:

1 The ceiling should:
   a. have at least 30 minutes fire resistance;
   b. be imperforate, except for an opening described in paragraph 10.14;
   c. extend throughout the building or compartment; and
   d. not be easily demountable.

2 The National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class unless they have been tested accordingly.

3 When a classification includes “s3, d2”, this means that there is no limit set for smoke production and/or flaming droplets/particles.

Page 81

Diagram 38: replace existing Note 1b with:

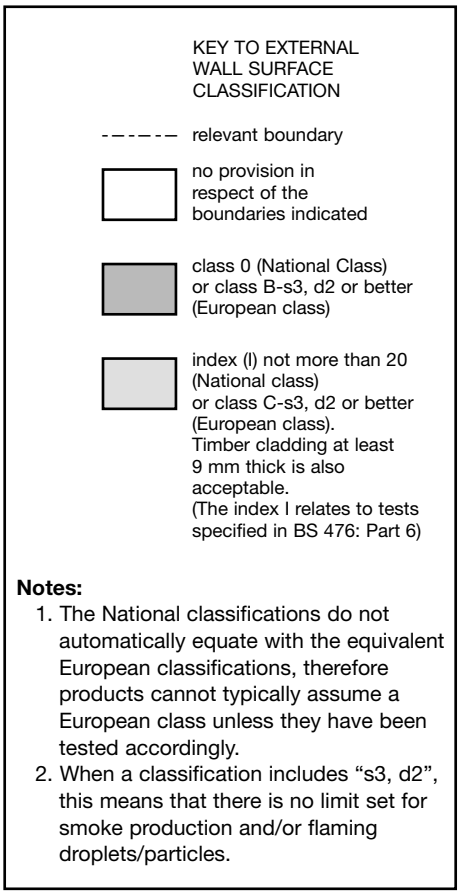
“b have internal surfaces (except framing members) of Class 0 (National class) or Class B-s3, d2 or better (European class), and

Note: When a classification includes “s3, d2”, this means that there is no limit set for smoke production and/or flaming droplets/particles.”

External fire spread

Page 88

Diagram 40: replace existing “Key” with:



Page 91

Paragraph 14.9: replace existing paragraph with:

“14.9 If an external wall has the appropriate fire resistance, but has combustible material more than 1mm thick as its external surface, then that wall is counted as an unprotected area amounting to half the actual area of the combustible material, see Diagram 43. (For the purposes of this provision, a material with a Class 0 rating (National class) or Class B-s3, d2 rating (European class) (see Appendix A, paragraphs 7 and 13) need not be counted as unprotected area).

Note: When a classification includes “s3, d2”, this means that there is no limit set for smoke production and/or flaming droplets/particles.”

Page 95

Paragraph 15.1: add new Note at end of existing paragraph.

“**Note:** Currently, no guidance is possible on the performance requirements in terms of the resistance of roof coverings to external fire exposure as determined by the methods specified in DD ENV 1187:2002, since there is no accompanying classification procedure and no supporting comparative data.”

Appendix A

PERFORMANCE OF MATERIALS AND STRUCTURES

Pages 109 to 119

Appendix A: replace existing Appendix with:

"Introduction

1 Much of the guidance in this document is given in terms of performance in relation to British or European Standards for products or methods of test or design or in terms of European Technical Approvals. In such cases the material, product or structure should:

a. be in accordance with a specification or design which has been shown by test to be capable of meeting that performance; or

Note: For this purpose, laboratories accredited by the United Kingdom Accreditation Service (UKAS) for conducting the relevant tests would be expected to have the necessary expertise.

b. have been assessed from test evidence against appropriate standards, or by using relevant design guides, as meeting that performance; or

Note: For this purpose, laboratories accredited by UKAS for conducting the relevant tests and suitably qualified fire safety engineers might be expected to have the necessary expertise.

For materials/products where European standards or approvals are not yet available and for a transition period after they become available, British standards may continue to be used. Any body notified to the UK Government by the Government of another member state of the European Union as capable of assessing such materials/products against the relevant British Standards, may also be expected to have the necessary expertise. Where European materials/products standards or approvals are available, any body notified to the European Commission as competent to assess such materials or products against the relevant European standards or technical approval can be considered to have the appropriate expertise.

c. where tables of notional performance are included in this document, conform with an appropriate specification given in these tables; or

d. in the case of fire-resisting elements:

i. conform with an appropriate specification given in Part II of the Building Research Establishments' Report *Guidelines for the construction of fire resisting structural elements* (BR 128, BRE 1988); or

ii. be designed in accordance with a relevant British Standard or Eurocode.

Note: Any test evidence used to substantiate the fire resistance rating of a construction should be carefully checked to ensure that it demonstrates compliance that is adequate and applicable to the intended use. Small differences in detail (such as fixing method, joints, dimensions, etc) may significantly affect the rating.

2 Building Regulations deal with fire safety in buildings as a whole. Thus they are aimed at limiting fire hazard.

The aim of standard fire tests is to measure or assess the response of a material, product, structure or system to one or more aspects of fire behaviour. Standard fire tests cannot normally measure fire hazard. They form only one of a number of factors that need to be taken into account. Other factors are set out in this publication.

Fire resistance

3 Factors having a bearing on fire resistance, that are considered in this document, are:

a. fire severity;

b. building height; and

c. building occupancy.

4 The standards of fire resistance given are based on assumptions about the severity of fires and the consequences should an element fail. Fire severity is estimated in very broad terms from the use of the building (its purpose group), on the assumption that the building contents (which constitute the fire load) are similar for buildings in the same use.

A number of factors affect the standard of fire resistance specified. These are:

a. the amount of combustible material per unit of floor area in various types of building (the fire load density);

b. the height of the top floor above ground, which affects the ease of escape and of fire fighting operations, and the consequences should large scale collapse occur;

c. occupancy type, which reflects the ease with which the building can be evacuated quickly;

d. whether there are basements, because the lack of an external wall through which to vent heat and smoke may increase heat build-up, and thus affect the duration of a fire, as well as complicating fire-fighting; and

e. whether the building is of single storey construction (where escape is direct and

structural failure is unlikely to precede evacuation).

Because the use of buildings may change, a precise estimate of fire severity based on the fire load due to a particular use may be misleading. Therefore if a fire engineering approach of this kind is adopted the likelihood that the fire load may change in the future needs to be considered.

5 Performance in terms of the fire resistance to be met by elements of structure, doors and other forms of construction is determined by reference to either:

(a) (National tests) BS 476 *Fire tests on building materials and structures*, Parts 20-24: 1987, ie Part 20 *Method for determination of the fire resistance of elements of construction (general principles),* Part 21 *Methods for determination of the fire resistance of loadbearing elements of construction*, Part 22 *Methods for determination of the fire resistance of non-loadbearing elements of construction*, Part 23 *Methods for determination of the contribution of components to the fire resistance of a structure*, and Part 24 *Method for determination of the fire resistance of ventilation ducts* (or to BS 476: Part 8: 1972 in respect of items tested or assessed prior to 1 January 1988); or

(b) (European tests) Commission Decision 2000/367/EC of 3rd May 2000 implementing Council Directive 89/106/EEC as regards the classification of the resistance to fire performance of construction products, construction works and parts thereof.

Note: The designation of xxxx is used for the year reference for standards that are not yet published. The latest version of any standard may be used provided that it continues to address the relevant requirements of the Regulations.

All products are classified in accordance with BS EN 13501-2:xxxx, *Fire classification of construction products and building elements, Part 2- Classification using data from fire resistance tests (excluding products for use in ventilation systems).*

BS EN 13501-3:xxxx, *Fire classification of construction products and building elements, Part 3-Classification using data from fire resistance tests on components of normal building service installations (other than smoke control systems).*

BS EN 13501-4:xxxx, *Fire classification of construction products and building elements, Part 4-Classification using data from fire resistance tests on smoke control systems.*

The relevant European test methods under BS EN 1364, 1365, 1366 and 1634 are listed in Appendix G.

Table A1 gives the specific requirements for each element in terms of one or more of the following performance criteria:

a. resistance to collapse (loadbearing capacity), which applies to loadbearing elements only, denoted R in the European classification of the resistance to fire performance;

b. resistance to fire penetration (integrity), denoted E in the European classification of the resistance to fire performance; and

c. resistance to the transfer of excessive heat (insulation), denoted I in the European classification of the resistance to fire performance.

Table A2 sets out the minimum periods of fire resistance for elements of structure.

Table A3 sets out criteria appropriate to the suspended ceilings that can be accepted as contributing to the fire resistance of a floor.

Table A4 sets out limitations on the use of uninsulated fire-resisting glazed elements. These limitations do not apply to the use of insulated fire-resisting glazed elements.

Information on tested elements is frequently given in literature available from manufacturers and trade associations.

Information on tests on fire-resisting elements is also given in such publications as:

Association for Specialist Fire Protection/Steel Construction Institute/Fire Test Study Group *Fire protection for structural steel in buildings*, second edition - revised, 1992. (Available from the ASFP, Association House, 99 West Street, Farnham, Surrey GU9 7EN and the Steel Construction Institute, Silwood Park, Ascot, Berks SL5 7QN).

Roofs

6 Performance in terms of the resistance of roofs to external fire exposure is determined by reference to the methods specified in BS 476: Part 3: 1958 *External fire exposure roof tests* under which constructions are designated by 2 letters in the range A to D, with an AA designation being the best. The first letter indicates the time to penetration, and the second letter a measure of the spread of flame.

Note: This is not the most recent version of the standard.

Currently, no guidance is possible on the performance in terms of the resistance of roofs to external fire exposure as determined by the methods specified in DD ENV 1187:2002, since there is no accompanying classification procedure and no comparative supporting data.

In some circumstances roofs, or parts of roofs, may need to be fire-resisting, for example if used as an escape route or if the roof performs the function of a floor. Such circumstances are covered in Sections 2, 6 and 8.

Table A5 gives notional designations of some generic roof coverings.

Reaction to fire

7 Performance in terms of reaction to fire to be met by construction products is determined by Commission Decision 200/147/EC of 8th February 2000 implementing Council Directive 89/106/EEC as regards the classification of the reaction to fire performance of construction products.

Note: The designation of xxxx is used for the year reference for standards that are not yet published. The latest version of any standard may be used provided that it continues to address the relevant requirements of the Regulations.

All products, excluding floorings, are classified as †A1, A2, B, C, D, E or F (with class A1 being the highest performance and F being the lowest) in accordance with BS EN 13501-1:2002, *Fire classification of construction products and building elements, Part 1-Classification using data from reaction to fire tests.*

The relevant European test methods are specified as follows,

BS EN ISO 1182:2002, *Reaction to fire tests for building products - Non-combustibility test.*

BS EN ISO 1716:2002 *Reaction to fire tests for building products - Determination of the gross calorific value.*

BS EN 13823:2002, *Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.*

BS EN ISO 11925-2:2002, *Reaction to fire tests for building Products, Part 2-Ignitability when subjected to direct impingement of a flame.*

BS EN 13238:2001, *Reaction to fire tests for building products-conditioning procedures and general rules for selection of substrates*.

Non-combustible materials

8 Non-combustible materials are defined in Table A6 either as listed products, or in terms of performance:

(a) (National classes) when tested to BS 476: Part 4: 1970 *Non-combustibility test for materials* or Part 11: 1982 *Method for assessing the heat emission from building products;* or

(b) (European classes) when classified as class A1 in accordance with BS EN 13501-1:2002, *Fire classification of construction products and building elements, Part 1-Classification using data from reaction to fire tests* when tested to BS EN ISO 1182:2002, *Reaction to fire tests for building products - Non-combustibility test* **and** BS EN ISO 1716:2002 *Reaction to fire tests for building products - Determination of the gross calorific value.*

Table A6 identifies non-combustible products and materials, and lists circumstances where their use is necessary.

Materials of limited combustibility

9 Materials of limited combustibility are defined in Table A7:

(a) (National classes) by reference to the method specified in BS 476: Part 11: 1982; or

(b) (European classes) in terms of performance when classified as class A2-s3, d2 in accordance with BS EN 13501-1:2002, *Fire classification of construction products and building elements, Part 1-Classification using data from reaction to fire tests* when tested to BS EN ISO 1182:2002, *Reaction to fire tests for building products - Non-combustibility test* **or** BS EN ISO 1716:2002 *Reaction to fire tests for building products - Determination of the gross calorific value* **and** BS EN 13823:2002, *Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.*

Table A7 also includes composite products (such as plasterboard) which are considered acceptable, and where these are exposed as linings they should also meet any appropriate flame spread rating.

Internal linings

10 Flame spread over wall or ceiling surfaces is controlled by providing for the lining materials or products to meet given performance levels in tests appropriate to the materials or products involved.

11 Under the National classifications, lining systems which can be effectively tested for 'surface spread of flame' are rated for performance by reference to the method specified in BS 476: Part 7: 1971 *Surface*

† The classes of reaction to fire performance of A2, B, C, D and E are accompanied by additional classifications related to the production of smoke (s1, s2, s3) and/or flaming droplets/particles (d0, d1, d2).

spread of flame tests for materials, or 1987 *Method for classification of the surface spread of flame of products*, or 1997 *Method of test to determine the classification of the surface spread of flame of products* under which materials or products are classified 1, 2, 3 or 4 with Class 1 being the highest.

Under the European classifications, lining systems are classified in accordance with BS EN 13501-1:2002, *Fire classification of construction products and building elements, Part 1-Classification using data from reaction to fire tests.* Materials or products are classified as A1, A2, B, C, D, E or F, with A1 being the highest. When a classification includes "s3, d2", it means that there is no limit set for smoke production and/or flaming droplets/particles.

12 To restrict the use of materials which ignite easily, which have a high rate of heat release and/or which reduce the time to flash over, maximum acceptable 'fire propagation' indices are specified, where the National test methods are being followed. These are determined by reference to the method specified in BS 476: Part 6: 1981 or 1989 *Method of test for fire propagation of products*. Index of performance (I) relates to the overall test performance, whereas sub-index (i_1) is derived from the first three minutes of test.

13 The highest National product performance classification for lining materials is Class 0. This is achieved if a material or the surface of a composite product is either:

a. composed throughout of materials of limited combustibility; or

b. a Class 1 material which has a fire propagation index (I) of not more than 12 and sub-index (i_1) of not more than 6.

Note: Class 0 is not a classification identified in any British Standard test.

14 Composite products defined as materials of limited combustibility (see paragraph 9 above and Table A7) should in addition comply with the test requirement appropriate to any surface rating specified in the guidance on requirements B2, B3 and B4.

15 The notional performance ratings of certain widely used generic materials or products are listed in Table A8 in terms of their performance in the traditional lining tests BS 476 Parts 6 and 7 or in accordance with BS EN 13501-1:2002, *Fire classification of construction products and building elements, Part 1-Classification using data from reaction to fire tests.*

16 Results of tests on proprietary materials are frequently given in literature available from manufacturers and trade associations.

Any reference used to substantiate the surface spread of flame rating of a material or product should be carefully checked to ensure that it is suitable, adequate and applicable to the construction to be used. Small differences in detail, such as thickness, substrate, colour, form, fixings, adhesive etc, may significantly affect the rating.

Thermoplastic materials

17 A thermoplastic material means any synthetic polymeric material which has a softening point below 200°C if tested to BS 2782 *Methods of testing plastics,* Part 1 *Thermal properties*, Method 120A: 1990 *Determination of the Vicat softening temperature of thermoplastics*. Specimens for this test may be fabricated from the original polymer where the thickness of material of the end product is less than 2.5 mm.

18 A thermoplastic material in isolation can not be assumed to protect a substrate, when used as a lining to a wall or ceiling. The surface rating of both products must therefore meet the required classification. If however, the thermoplastic material is fully bonded to a non-thermoplastic substrate, then only the surface rating of the composite will need to comply.

19 Concessions are made for thermoplastic materials used for window glazing, rooflights, and lighting diffusers within suspended ceilings, which may not comply with the criteria specified in paragraphs 11 et seq. They are described in the guidance on requirements B2 and B4.

20 For the purposes of the requirements B2 and B4 thermoplastic materials should either be used according to their classification 0-3, under the BS 476: Parts 6 and 7 tests as described in paragraphs 11 et seq, if they have such a rating, or they may be classified TP(a) rigid, TP(a) flexible, or TP(b) according to the following methods:

TP(a) rigid:

i. Rigid solid pvc sheet;

ii. Solid (as distinct from double- or multiple- - skin) polycarbonate sheet at least 3 mm thick;

iii. Multi-skinned rigid sheet made from unplasticised pvc or polycarbonate which has a Class 1 rating when tested to BS 476: Part 7: 1971, 1987 or 1997;

iv. Any other rigid thermoplastic product, a specimen of which (at the thickness of the product as put on the market), when tested to BS 2782: 1970 as amended in 1974: Method 508A *Rate of burning (Laboratory method)*, performs so that the test flame extinguishes before the first mark, and the duration of flaming or afterglow does not exceed 5 seconds following removal of the burner.

TP(a) flexible:

Flexible products not more than 1 mm thick which comply with the Type C requirements of BS 5867 *Specification for fabrics for curtains and drapes* Part 2 *Flammability requirements* when tested to BS 5438 *Methods of test for flammability of textile fabrics when subjected to a small igniting flame applied to the face or bottom edge of vertically oriented specimens*, Test 2, 1989 with the flame applied to the surface of the specimens for 5, 15, 20 and 30 seconds respectively, but excluding the cleansing procedure; and

TP(b):

i. Rigid solid polycarbonate sheet products less than 3 mm thick, or multiple-skin polycarbonate sheet products which do not qualify as TP(a) by test. or

ii. Other products which, when a specimen of the material between 1.5 and 3 mm thick is tested in accordance with BS 2782: 1970, as amended in 1974: Method 508A, has a rate of burning which does not exceed 50 mm/minute.

Note: If it is not possible to cut or machine a 3 mm thick specimen from the product then a 3 mm test specimen can be moulded from the same material as that used for the manufacture of the product.

Note: Currently, no new guidance is possible on the assessment or classification of thermoplastic materials under the European system since there is no generally accepted European test procedure and supporting comparative data.

Fire test methods

21 A guide to the various test methods in BS 476 and BS 2782 is given in PD 6520 Guide to fire test methods for building materials and elements of construction (available from the British Standards Institution).

A guide to the development and presentation of fire tests and their use in hazard assessment is given in BS 6336 *Guide to development and presentation of fire tests and their use in hazard assessment.*

Table A1 Specific provisions of test for fire resistance of elements of structure etc.

Part of building	Minimum provisions when tested to the relevant part of BS 476(1) (minutes)			Minimum provisions when tested to the relevant European standard (minutes)(12)	Method of exposure
	Loadbearing capacity (2)	Integrity	Insulation		
1. **Structural** frame, beam or column	see Table A2	not applicable	not applicable	R see Table A2	exposed faces
2. **Loadbearing wall** (which is not also a wall described in any of the following items).	see Table A2	not applicable	not applicable	R see Table A2	each side separately
3. **Floors (3)**					
a. in upper storey of 2-storey dwelling house (but not over garage or basement);	30	15	15	REI 30 (9)	
b. between a shop and flat above;	60 or see Table A2 (whichever is greater)	60 or see Table A2 (whichever is greater)	60 or see Table A2 (whichever is greater)	REI 60 or see Table A2 (whichever is greater)	from underside (4)
c. any other floor, including compartment floors.	see Table A2	see Table A2	see Table A2	REI see Table A2	
4. **Roofs**					
a. any part forming an escape route;	30	30	30	REI 30	from underside (4)
b. any roof that performs the function of a floor.	see Table A2	see Table A2	see Table A2	REI see Table A2	
5. **External walls**					
a. any part less than 1000mm from any point on the relevant boundary;	See Table A2	see Table A2	see Table A2	REI see Table A2	each side separately
b. any part 1000mm or more from the relevant boundary(5);	see Table A2	see Table A2	15	REI see Table A2 (10)	from inside the building
c. any part adjacent to an external escape route (see Section 6, Diagram 22).	30	30	no provision (6)(7)	RE 30	from inside the building
6. **Compartment walls** Separating occupancies (see 9.20f)	60 or see Table A2 (whichever is less)	60 or see Table A2 (whichever is less)	60 or see Table A2 (whichever is less)	REI 60 or see Table A2 (whichever is less)	each side separately
7. **Compartment walls** (other than in item 6)	see Table A2	see Table A2	see Table A2	REI see Table A2	each side separately
8. **Protected shafts**, excluding any firefighting shaft					
a. any glazing described in Section 9, Diagram 30;	not applicable	30	no provision (7)	E 30	
b. any other part between the shaft and a protected lobby/corridor described in Diagram 30 above;	30	30	30	REI 30	each side separately
c. any part not described in (a) or (b) above.	see table A2	see table A2	see table A2	REI see table A2	
9. **Enclosure** (which does not form part of a compartment wall or a protected shaft) to a:					each side separately
a. protected stairway;	30	30	30 (8)	REI 30 (8)	
b. lift shaft	30	30	30	REI 30	

Table A1 continued

Part of building	Minimum provisions when tested to the relevant part of BS 476 (1) (minutes)			Minimum provisions when tested to the relevant European standard (minutes)(12)	Method of exposure
	Loadbearing capacity (2)	Integrity	Insulation		
10. **Firefighting shafts**					
a. construction separating firefighting shaft from rest of building;	120	120	120	REI 120	from side remote from shaft
	60	60	60	REI 60	from shaft side
b. construction separating firefighting stair, firefighting lift shaft and firefighting lobby.	60	60	60	REI 60	each side separately
11. **Enclosure** (which is not a compartment wall or described in item 8) to a:					each side separately
a. protected lobby;	30	30	30 (8)	REI 30 (8)	
b. protected corridor.	30	30	30 (8)	REI 30 (8)	
12. **Sub-division of a corridor**	30	30	30 (8)	REI 30 (8)	each side separately
13. **Wall separating** an attached or integral garage from a dwellinghouse	30	30	30 (8)	REI 30 (8)	from garage side
14. **Enclosure** in a flat or maisonette to a protected entrance hall, or to a protected landing.	30	30	30 (8)	REI 30 (8)	each side separately
15. **Fire-resisting construction**:					each side separately
a. in dwellings not described elsewhere;	30	30	30 (8)	REI 30 (8)	
b. enclosing places of special fire hazard (see 9.12);	30	30	30	REI 30	
c. between store rooms and sales area in shops (see 6.54)	30	30	30	REI 30	
d. fire-resisting subdivision described in Section 10, Diagram 34(b)	30	30	30	REI 30	
16. **Cavity barrier**	not applicable	30	15	EI 30 (11)	each side separately
17. **Ceiling** described in Section 10, Diagram 33 or Diagram 35	not applicable	30	30	EI 30	from underside
18. **Duct** described in paragraph 10.14e	not applicable	30	no provision	E 30	from outside
19. **Casing** around a drainage system described in Section 11, Diagram 38	not applicable	30	no provision	E 30	from outside
20. **Flue walls** described in Section 11, Diagram 39	not applicable	half the period specified in Table A2 for the compartment wall/floor	half the period specified in Table A2 for the compartment wall/floor	EI half the period specified in Table A2 for the compartment wall/floor	from outside
21. **Construction** described in Note (a) to paragraph 15.9.	not applicable	30	30	EI 30	from underside
22. **Fire doors**	see Table B1			see Table B1	

Table A1 continued

Notes:

1. Part 21 for loadbearing elements, Part 22 for non-loadbearing elements, Part 23 for fire-protecting suspended ceilings, and Part 24 for ventilation ducts. BS 476:Part 8 results are acceptable for items tested or assessed before 1st January 1988.
2. Applies to loadbearing elements only (see B3.ii and Appendix E).
3. Guidance on increasing the fire resistance of existing timber floors is given in BRE Digest 208 Increasing the fire resistance of existing timber floors (BRE 1988).
4. A suspended ceiling should only be relied on to contribute to the fire resistance of the floor if the ceiling meets the appropriate provisions given in Table A3.
5. The guidance in Section 14 allows such walls to contain areas which need not be fire-resisting (unprotected areas).
6. Unless needed as part of a wall in item 5a or 5b.
7. Except for any limitations on glazed elements given in Table A4.
8. See Table A4 for permitted extent of uninsulated glazed elements.
9. For the purposes of meeting the Building Regulations floors under item 3a will be deemed to have satisfied the provisions above, provided that they achieve loadbearing capacity of at least 30 minutes and integrity and insulation requirements of at least 15 minutes when tested in accordance with the relevant European test.
10. For the purposes of meeting the Building Regulations external walls under item 5b will be deemed to have satisfied the provisions above, provided that they achieve the loadbearing capacity and integrity requirements as defined in Table A2 and an insulation requirement of at least 15 minutes.
11. For the purposes of meeting the Building Regulations cavity barriers will be deemed to have satisfied the provisions above, provided that they achieve an integrity requirement of at least 30 minutes and an insulation requirement of at least 15 minutes.
12. The National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class unless they have been tested accordingly.
    “R” is the European classification of the resistance to fire performance in respect of loadbearing capacity;
    “E” is the European classification of the resistance to fire performance in respect of integrity; and
    “I” is the European classification of the resistance to fire performance in respect of insulation.

Table A2 **Minimum periods of fire resistance**

Purpose group of building	Minimum periods (minutes) for elements of structure in a:					
	Basement storey ($) including floor over		Ground or upper storey			
	Depth (m) of a lowest basement		Height (m) of top floor above ground, in a building or separated part of a building			
	more than 10	not more than 10	not more than 5	not more than 18	not more than 30	more than 30
1. Residential (domestic):						
a. flats and maisonettes	90	60	30*	60**†	90**	120**
b. and c. dwellinghouses	not relevant	30*	30*	60@	not relevant	not relevant
2. Residential:						
a. Institutional œ	90	60	30*	60	90	120#
b. Other residential	90	60	30*	60	90	120#
3. Office:						
- not sprinklered	90	60	30*	60	90	not permitted
- sprinklered (2)	60	60	30*	30*	60	120#
4. Shop and commercial:						
- not sprinklered	90	60	60	60	90	not permitted
- sprinklered (2)	60	60	30*	60	60	120#
5. Assembly and recreation:						
- not sprinklered	90	60	60	60	90	not permitted
- sprinklered (2)	60	60	30*	60	60	120#
6. Industrial:						
- not sprinklered	120	90	60	90	120	not permitted
- sprinklered (2)	90	60	30*	60	90	120#
7 Storage and other non-residential:						
a. any building or part not described elsewhere:						
- not sprinklered	120	90	60	90	120	not permitted
- sprinklered (2)	90	60	30*	60	90	120#
b. car park for light vehicles:						
i. open sided car park (3)	not applicable	not applicable	15* +(4)	15*+(4)	15*+(4)	60
ii. any other car park	90	60	30*	60	90	120#

Single storey buildings are subject to the periods under the heading “not more than 5”. If they have basements, the basement storeys are subject to the period appropriate to their depth.

Modifications referred to in Table A2: [for application of the table see next page]

$ The floor over a basement (or if there is more than 1 basement, the floor over the topmost basement) should meet the provisions for the ground and upper storeys if that period is higher.
* Increased to a minimum of 60 minutes for compartment walls separating buildings.
** Reduced to 30 minutes for any floor within a maisonette, but not if the floor contributes to the support of the building.
œ Multi-storey hospitals designed in accordance with the NHS Firecode document should have a minimum 60 minutes standard.
Reduced to 90 minutes for elements not forming part of the structural frame.
+ Increased to 30 minutes for elements protecting the means of escape.
† Refer to paragraph 8.10 regarding the acceptability of 30 minutes in flat conversions.
@ 30 minutes in the case of 3 storey dwellinghouses, increased to 60 minutes minimum for compartment walls separating buildings.

Notes:

1. Refer to Table A1 for the specific provisions of test.
2. “Sprinklered” means that the building is fitted throughout with an automatic sprinkler system meeting the relevant recommendations of BS 5306 Fire extinguishing installations and equipment on premises. Part 2 Specification for sprinkler systems; ie the relevant occupancy rating together with the additional requirements for life safety.
3. The car park should comply with the relevant provisions in the guidance on requirement B3, Section 12.
4. For the purposes of meeting the Building Regulations, the following types of steel elements are deemed to have satisfied the minimum period of fire resistance of 15 minutes when tested to the European test method;
   i) Beams supporting concrete floors, maximum Hp/A=230m-1 operating under full design load.
   ii) Free standing columns, maximum Hp/A=180m-1 operating under full design load.
   iii) Wind bracing and struts, maximum Hp/A=210m-1 operating under full design load.

Guidance is also available in BS5950 Structural use of steelwork in building. Part 8 Code of practice for fire resistant design.

Application of the fire resistance standards in Table A2:

a. Where one element of structure supports or carries or gives stability to another, the fire resistance of the supporting element should be no less than the minimum period of fire resistance for the other element (whether that other element is loadbearing or not).

There are circumstances where it may be reasonable to vary this principle, for example:

i. where the supporting structure is in the open air, and is not likely to be affected by the fire in the building; or

ii. the supporting structure is in a different compartment, with a fire-separating element (which has the higher standard of fire resistance) between the supporting and the separated structure; or

iii. where a plant room on the roof needs a higher fire resistance than the elements of structure supporting it.

b. Where an element of structure forms part of more than one building or compartment, that element should be constructed to the standard of the greater of the relevant provisions.

c. Where one side of a basement is (due to the slope of the ground) open at ground level, giving an opportunity for smoke venting and access for fire fighting, it may be appropriate to adopt the standard of fire resistance applicable to above-ground structures for elements of structure in that storey.

d. Although most elements of structure in a single storey building may not need fire resistance (see the guidance on requirement B3, paragraph 8.4(a)), fire resistance will be needed if the element:

i. is part of (or supports) an external wall and there is provision in the guidance on requirement B4 to limit the extent of openings and other unprotected areas in the wall; or

ii. is part of (or supports) a compartment wall, including a wall common to two or more buildings, or a wall between a dwelling house and an attached or integral garage; or

iii. supports a gallery.

For the purposes of this paragraph, the ground storey of a building which has one or more basement storeys and no upper storeys, may be considered as a single storey building. The fire resistance of the basement storeys should be that appropriate to basements.

Table A3 **Limitations on fire-protecting suspended ceilings** (see Table A1, Note 4)

Height of building or separated part (m)	Type of floor	Provision for fire resistance or floor (minutes)	Description of suspended ceiling
less than 18	not compartment	60 or less	Type W, X, Y or Z
	compartment	less than 60	
		60	Type X, Y or Z
18 or more	any	60 or less	Type Y or Z
no limit	any	more than 60	Type Z

Notes:

1. Ceiling type and description (the change from Types A-D to Types W-Z is to avoid confusion with Classes A-D (European)):
   W. Surface of ceiling exposed to the cavity should be Class 0 or Class 1 (National) or Class C-s3, d2 or better (European).
   X. Surface of ceiling exposed to the cavity should be Class 0 (National) or Class B-s3, d2 or better (European).
   Y. Surface of ceiling exposed to the cavity should be Class 0 (National) or Class B-s3, d2 or better (European). Ceiling should not contain easily openable access panels.
   Z. Ceiling should be of a material of limited combustibility (National) or of Class A2-s3, d2 or better (European) and not contain easily openable access panels. Any insulation above the ceiling should be of a material of limited combustibility (National) or Class A2-s3, d2 or better (European).
2. Any access panels provided in fire protecting suspended ceilings of type Y or Z should be secured in position by releasing devices or screw fixings, and they should be shown to have been tested in the ceiling assembly in which they are incorporated.
3. European classifications

The National classifications do not automatically equate with the equivalent European classifications, therefore products cannot typically assume a European class unless they have been tested accordingly.
When a classification includes “s3, d2”, this means that there is no limit set for smoke production and/or flaming droplets/particles.

Table A4 **Limitations on the use of uninsulated glazed elements on escape routes** (These limitations do not apply to glazed elements which satisfy the relevant insulation criterion, see Table A1) (See BS 5588: Part 7 for glazing to atria; see BS 5588: Part 8 for glazing to refuges)

Position of glazed element	**Maximum total glazed area in parts of a building with access to:**			
	a single stairway		**more than one stairway**	
	walls	**door leaf**	**walls**	**door leaf**
Single family dwellinghouses				
1. a. Within the enclosures of: i. a protected stairway, or within fire-resisting separation shown in Section 2 Diagram 3; or	fixed fanlights only	unlimited	fixed fanlights only	unlimited
ii. an existing stair (see para 2.18).	unlimited	unlimited	unlimited	unlimited
b. Within fire-resisting separation: i. shown in Section 2 Diagram 4, or ii. described in paras 2.13b & 2.20.	unlimited above 100 mm from floor	unlimited above 100 mm from floor	unlimited above 100 mm from floor	unlimited above 100 mm from floor
c. Existing window between an attached/integral garage and the house.	unlimited	not applicable	unlimited	not applicable
Flats and maisonettes 2. Within the enclosures of a protected entrance hall or protected landing or within fire-resisting separation shown in Section 3 Diagram 9.	fixed fanlights only	unlimited above 1100mm from floor	fixed fanlights only	unlimited above 1100 mm from floor
General (except dwellinghouses) 3. Between residential/sleeping accommodation and a common escape route (corridor, lobby or stair).	nil	nil	nil	nil
4. Between a protected stairway (1) and: a. the accommodation; or b. a corridor which is not a protected corridor. Other than in item 3 above.	nil	25% of door area	unlimited above 1100 mm [2]	50% of door area
5. Between: a. a protected stairway (1) and a protected lobby or protected corridor; or b. accommodation and a protected lobby. Other than in item 3 above.	unlimited above 1100 mm from floor	unlimited above 100 mm from floor	unlimited above 1100 mm from floor	unlimited above 100 mm from floor
6. Between the accommodation and a protected corridor forming a dead end. Other than in item 3 above.	unlimited above 1100 mm from floor	unlimited above 100 mm from floor	unlimited above 1100 mm from floor	unlimited above 100 mm from floor
7. Between accommodation and any other corridor; or subdividing corridors. Other than in item 3 above.	not applicable	not applicable	not applicable 100 mm from floor	not applicable 100 mm from floor
8. Adjacent an external escape route described in para 4.27.	unlimited above 1100 mm from paving	unlimited above 1100 mm from paving	unlimited above 1100 mm from paving	unlimited above 1100 mm from paving
9. Adjacent an external escape stair (see para 6.25 & Diagram 22) or roof escape (see para 6.35).	unlimited	unlimited	unlimited	unlimited

Notes:

1. If the protected stairway is also a protected shaft (see paragraph 9.36) or a firefighting stair (see Section 18) there may be further restrictions on the uses of glazed elements.
2. Measured vertically from the landing floor level or the stair pitch line.
3. The 100 mm limit is intended to reduce the risk of fire spread from a floor covering.
4. Items 1c, 3 and 6 apply also to single storey buildings.

Table A5 **Notional designations of roof coverings**

Part i: Pitched roofs covered with slates or tiles

Covering material	Supporting structure	Designation
1. Natural slates 2. Fibre reinforced cement slates 3. Clay tiles 4. Concrete tiles	timber rafters with or without underfelt, sarking, boarding, woodwool slabs, compressed straw slabs, plywood, wood chipboard, or fibre insulating board	AA

Note: Although the Table does not include guidance for roofs covered with bitumen felt, it should be noted that there is a wide range of materials on the market and information on specific products is readily available from manufacturers.

Part ii: Pitched roofs covered with self-supporting sheet

Roof covering material	Construction	Supporting structure	Designation
1. Profiled sheet of galvanised steel, aluminium, fibre reinforced cement, or pre-painted (coil coated) steel or aluminium with a pvc or pvf2 coating	single skin without underlay, or with underlay or plasterboard, fibre insulating board, or woodwool slab	structure of timber, steel or concrete	AA
2. Profiled sheet of galvanised steel, aluminium, fibre reinforced cement, or pre-painted (coil coated) steel or aluminium with a pvc or pvf2 coating	double skin without interlayer, or with interlayer of resin bonded glass fibre, mineral wool slab, polystyrene, or polyurethane	structure of timber, steel or concrete	AA

Part iii. Flat roofs covered with bitumen felt

A flat roof comprising of bitumen felt should (irrespective of the felt specification) be deemed to be of designation AA if the felt is laid on a deck constructed of 6 mm plywood, 12.5 mm wood chipboard, 16 mm (finished) plain edged timber boarding, compressed straw slab, screeded wood wool slab, profiled fibre reinforced cement or steel deck (single or double skin) with or without fibre insulating board overlay, profiled aluminium deck (single or double skin) with or without fibre insulating board overlay, or concrete or clay pot slab (insitu or pre cast), and has a surface finish of:

a. bitumen-bedded stone chippings covering the whole surface to a depth of at least 12.5 mm;
b. bitumen-bedded tiles of a non-combustible material;
c. sand and cement screed; or
d. macadam.

Part iv. Pitched or flat roofs covered with fully supported material

Covering material	Supporting structure	Designation
1. Aluminium sheet 2. Copper sheet 3. Zinc sheet 4. Lead sheet 5. Mastic asphalt 6. Vitreous enamelled steel 7. Lead/tin alloy coated steel sheet 8. Zinc/aluminium alloy coated steel sheet 9. Pre-painted (coil coated) steel sheet including liquid-applied pvc coatings	timber joists and: tongued and grooved boarding, or plain edged boarding	AA*
	steel or timber joists with deck of: woodwool slabs, compressed straw slab, wood chipboard, fibre insulating board, or 9.5 mm plywood	AA
	concrete or clay pot slab (insitu or pre-cast) or non-combustible deck of steel, aluminium, or fibre cement (with or without insulation)	AA

Notes:

* Lead sheet supported by timber joists and plain edged boarding should be regarded as having a BA designation.

Table A6 **Use and definitions of non-combustible materials**

References in AD.B guidance to situations where such materials should be used	**Definitions of non-combustible materials**	
	National class	**European class**
1. ladders referred to in the guidance to B1, paragraph 6.22. 2. refuse chutes meeting the provisions in the guidance to B3, paragraph 9.35c. 3. suspended ceilings and their supports where there is provision in the guidance to B3, paragraph 10.13, for them to be constructed of non-combustible materials. 4. pipes meeting the provisions in the guidance to B3, Table 15. 5. flue walls meeting the provisions in the guidance to B3, Diagram 39. 6. construction forming car parks referred to in the guidance to B3, paragraph 12.3.	a. Any material which when tested to BS476 : Part 11 does not flame nor cause any rise in temperature on either the centre (specimen) or furnace thermocouples b. Totally inorganic materials such as concrete, fired clay, ceramics, metals, plaster and masonry containing not more than 1% by weight or volume of organic material. (Use in buildings of combustible metals such as magnesium/aluminium alloys should be assessed in each individual case. c. Concrete bricks or blocks meeting BS 6073 : Part 1 d. Products classified as non-combustible under BS 476 : Part 4	a. Any material classified as class A1 in accordance with BS EN 13501-1:2002, Fire classification of construction products and building elements, Part 1-Classification using data from reaction to fire tests. b. Products made from one or more of the materials considered as Class A1 without the need for testing, as defined in Commission Decision 96/603/EC of 4th October 1996 establishing the list of products belonging to Class A1 "No contribution to fire" provided for in the Decision 94/611/EC implementing Article 20 of the Council Directive 89/106/EEC on construction products. None of the materials shall contain more than 1.0% by weight or volume (whichever is the lower) of homogeneously distributed organic material.
		Note: The National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class unless they have been tested accordingly.

Table A7 Use and definitions of materials of limited combustibility

References in AD.B guidance to situations where such materials should be used	Definitions of non-combustible materials	
	National class	**European class**
1. stairs where there is provision in the guidance to B1 for them to be constructed of materials of limited combustibility (see 6.19). 2. materials above a suspended ceiling meeting the provisions in the guidance to B3, paragraph 10.13. 3. reinforcement/support for fire-stopping referred to in the guidance to B3, see 11.13. 4. roof coverings meeting provisions: a. in the guidance to B3, paragraph 10.11 or b. in the guidance to B4, Table 17 or c. in the guidance to B4, Diagram 47. 5. roof deck meeting the provisions of the guidance to B3, Diagram 28a. 6. class 0 materials meeting the provisions in Appendix A, paragraph 13(a). 7. ceiling tiles or panels of any fire protecting suspended ceiling (Type Z) in Table A3. 8. compartment walls and compartment floors in hospitals referred to in paragraph 9.32.	a. Any non-combustible material listed in Table A6. b. Any material of density 300/kg/m^3 or more, which when tested to BS476: Part 11, does not flame and the rise in temperature on the furnace thermocouple is not more than 20°C. c. Any material with a non-combustible core at least 8mm thick having combustible facings (on one or both sides) not more than 0.5mm thick. (Where a flame spread rating is specified, these materials must also meet the appropriate test requirements).	a. Any material listed in Table A6. b. Any material/product classified as Class A2-s3, d2 or better in accordance with BS EN 13501-1:2002, *Fire classification of construction products and building elements, Part 1-Classification using data from reaction to fire tests.*
9. insulation material in external wall construction referred to in paragraph 13.7. 10. insulation above any fire-protecting suspended ceiling (Type Z) in Table A3.	Any of the materials (a), (b) or (c) above, or: d. Any material of density less than 300kg/m^3, which when tested to BS476:Part 11, does not flame for more than 10 seconds and the rise in temperature on the centre (specimen) thermocouple is not more than 35°C and on the furnace thermocouple is not more than 25°C.	Any of the materials/products (a) or (b) above
		Notes: 1. The National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class unless they have been tested accordingly. 2. When a classification includes "s3, d2", this means that there is no limit set for smoke production and/or flaming droplets/particles.

Table A8 **Typical performance ratings of some generic materials and products**

Rating	Material or product
Class 0 (National)	1. any non-combustible material or material of limited combustibility. (Composite products listed in Table A7 must meet test requirements given in Appendix A, paragraph 13(b)). 2. brickwork, blockwork, concrete and ceramic tiles. 3. plasterboard (painted or not with a PVC facing not more than 0.5mm thick) with or without an air gap or fibrous or cellular insulating material behind. 4. woodwool cement slabs. 5. mineral fibre tiles or sheets with cement or resin binding.
Class 3 (National)	6. timber or plywood with a density more than 400kg/m^3, painted or unpainted. 7. wood particle board or hardboard, either untreated or painted. 8. standard glass reinforced polyesters.
Class A1 (European)	9. Any material that achieves this class and is defined as "classified without further test" in a published Commission Decision.
Class A2-s3, d2 (European)	10. Any material that achieves this class and is defined as "classified without further test" in a published Commission Decision.
Class B-s3, d2 (European)	11. Any material that achieves this class and is defined as "classified without further test" in a published Commission Decision.
Class C-s3, d2 (European)	12. Any material that achieves this class and is defined as "classified without further test" in a published Commission Decision.
Class D-s3, d2 (European)	13. Any material that achieves this class and is defined as "classified without further test" in a published Commission Decision.

Notes (National):

1. Materials and products listed under Class 0 also meet Class 1.
2. Timber products listed under Class 3 can be brought up to Class 1 with appropriate proprietary treatments.
3. The following materials and products may achieve the ratings listed below. However, as the properties of different products with the same generic description vary, the ratings of these materials/ products should be substantiated by test evidence.
   Class 0 – aluminium faced fibre insulating board, flame retardant decorative laminates on a calcium silicate board, thick polycarbonate sheet, phenolic sheet and UPVC;
   Class 1 – phenolic or melamine laminates on a calcium silicate substrate and flame retardant decorative laminates on a combustible substrate.

Notes (European):

For the purposes of the Building Regulations

1. Materials and products listed under Class A1 also meet Classes A2-s3, d2, B-s3, d2, C-s3, d2 and D-s3, d2.
2. Materials and products listed under Class A2-s3, d2 also meet Classes B-s3, d2, C-s3, d2 and D-s3, d2.
3. Materials and products listed under Class B-s3, d2 also meet Classes C-s3, d2 and D-s3, d2.
4. Materials and products listed under Class C-s3, d2 also meet Class D-s3, d2.
5. The performance of timber products listed under Class D-s3, d2 can be improved with appropriate proprietary treatments.
6. Materials covered by the CWFT process (classification without further testing) can be can be found by accessing the European Commission's website via the link on the ODPM's web site www.odpm.gov.uk/bregs/cpd/index.htm.
7. The National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class unless they have been tested accordingly.
8. When a classification includes "s3, d2", this means that there is no limit set for smoke production and/or flaming droplets/particles.

Appendix B

FIRE DOORS

Page 120

Paragraph 1: replace existing paragraph with:

"1 All fire doors should have the appropriate performance given in Table B1 either:

(a) by their performance under test to BS 476 *Fire tests on building materials and structures, Part 22 Methods for determination of the fire resistance of non-loadbearing elements of construction*, in terms of integrity for a period of minutes, eg FD30. A suffix (S) is added for doors where restricted smoke leakage at ambient temperatures is needed; or

(b) as determined with reference to Commission Decision 2000/367/EC of 3rd May 2000 implementing Council Directive 89/106/EEC as regards the classification of the resistance to fire performance of construction products, construction works and parts thereof. All fire doors should be classified in accordance with BS EN 13501-2: xxxx, *Fire classification of construction products and building elements, Part 2 – Classification using data from fire resistance tests (excluding products for use in ventilation systems)*. They are tested to the relevant European method from the following:

BS EN 1634-1: 2000, *Fire resistance tests for door and shutter assemblies, Part 1 – Fire doors and shutters;*

BS EN 1634-2: xxxx, *Fire resistance tests for door and shutter assemblies, Part 2 – Fire door hardware;*

BS EN 1634-3: xxxx, *Fire resistance tests for door and shutter assemblies, Part 3 – Smoke control doors.*

The performance requirement is in terms of integrity (E) for a period of minutes. An additional classification of S_a is used for all doors where restricted smoke leakage at ambient temperatures is needed.

The requirement (in either case) is for test exposure from each side of the door separately, except in the case of lift doors which are tested from the landing side only.

Notes:

1. The designation of xxxx is used for standards that are not yet published. The latest version of any standard may be used provided that it continues to address the relevant requirements of the Regulations.

2. Until such time that the relevant harmonised product standards are published, for the purposes of meeting the Building Regulations, products tested in accordance with BS EN 1634-1 (with or without pre-fire test mechanical conditioning) will be deemed to have satisfied the provisions provided that they achieve the minimum fire resistance in terms of integrity, as detailed in Table B1."

Page 120

Paragraph 9(d): replace existing paragraph with:

"d. lift entrance/landing doors.

Paragraph 11: replace existing paragraph with:

"11 BS 8214 *Code of practice for fire door assemblies with non-metallic leaves* gives recommendations for the specification, design, construction, installation and maintenance of fire doors constructed with non-metallic door leaves.

Guidance on timber fire-resisting doorsets, in relation to the new European test standard, may be found in *"Timber Fire-Resisting Doorsets: maintaining performance under the new European test standard"* published by TRADA.

Guidance for metal doors is given in Code of *practice for fire-resisting metal doorsets* published by the DSMA (Door and Shutter Manufacturers' Association) in 1999."

Paragraph 12: replace existing paragraph with:

"12 Hardware used on fire doors can significantly affect performance in fire. Notwithstanding the guidance in this Approved Document guidance is available in *"Hardware for timber and escape doors"* published by the Builders Hardware Industry Federation in November 2000."

Page 121

Table B1: replace existing table with:

Table B1 **Provisions for fire doors**

Position of door	**Minimum fire resistance of door in terms of integrity (minutes) when tested to BS 476 part 22(1)**	**Minimum fire resistance of door in terms of integrity (minutes) when tested to the relevant European standard**
1. In a compartment wall separating buildings	As for the wall in which the door is fitted, but a minimum of 60	As for the wall in which the door is fitted, but a minimum of 60
2. In a compartment wall:		
a. If it separates a flat or maisonette from a space in common use;	FD 30S (2)	E30 S_a (3)
b. Enclosing a protected shaft forming a stairway situated wholly or partly above the adjoining ground in a building used for Flats, Other Residential, Assembly and Recreation, or Office purposes;	FD 30S (2)	E30 S_a (3)
c. enclosing a protected shaft forming a stairway not described in (b) above;	Half the period of fire resistance of the wall in which it is fitted, but 30 minimum and with suffix S (2)	Half the period of fire resistance of the wall in which it is fitted, but 30 minimum and with suffix S_a(3)
d. enclosing a protected shaft forming a lift or service shaft;	Half the period of fire resistance of the wall in which it is fitted, but 30 minimum	Half the period of fire resistance of the wall in which it is fitted, but 30 minimum
e. not described in (a), (b), (c) or (d) above.	As for the wall it is fitted in, but add S (2) if the door is used for progressive horizontal evacuation under the guidance to B1	As for the wall it is fitted in, but add S_a(3) if the door is used for progressive horizontal evacuation under the guidance to B1
3. In a compartment floor	As for the floor in which it is fitted	As for the floor in which it is fitted
4. Forming part of the enclosures of:		
a. a protected stairway (except where described in item 9); or	FD 30S (2)	E30 S_a (3)
b. a lift shaft (see paragraph 6.42b); which does not form a protected shaft in 2(b), (c) or (d) above.	FD 30	E30
5. Forming part of the enclosure of:		
a. a protected lobby approach (or protected corridor) to a stairway;	FD 30S (2)	E30 S_a (3)
b. any other protected corridor; or	FD 20 (S)	E20 S_a (3)
c. a protected lobby approach to a lift shaft (see paragraph 6.42)	FD 30S (2)	E30 S_a (3)
6. Affording access to an external escape route	FD 30	E30
7. Sub-dividing:		
a. corridors connecting alternative exits;	FD 20S (2)	E20 S_a (3)
b. dead-end portions of corridors from the remainder of the corridor	FD 20S (2)	E20 S_a (3)
8. Any door:		
a. within a cavity barrier;	FD 30	E30
b. between a dwellinghouse and a garage	FD 30	E30

Table B1 **Provisions for fire doors** continued

Position of door	Minimum fire resistance of door in terms of integrity (minutes) when tested to BS 476 part 22(1)	Minimum fire resistance of door in terms of integrity (minutes) when tested to the relevant European standard
9. Any door: a. forming part of the enclosures to a protected stairway in a single family dwelling house;	FD 20	E20
b. forming part of the enclosure to a protected entrance hall or protected landing in a flat or maisonette;	FD 20	E20
c. within any other fire-resisting construction in a dwelling not described elsewhere in this table	FD 20	E20

Notes:

1. To BS 476: Part 22 (or BS 476: Part 8 subject to paragraph 5 in Appendix A).
2. Unless pressurization techniques complying with BS 5588: Part 4 *Fire precautions in the design, construction and use of buildings, Code of practice for smoke control using pressure differentials* are used, these doors should also either:
   (a) have a leakage rate not exceeding $3m^3/m$/hour (head and jambs only) when tested at 25 Pa under BS 476 *Fire tests on building materials and structures*, Section 31.1 *Methods for measuring smoke penetration through doorsets and shutter assemblies, Method of measurement under ambient temperature conditions*; or
   (b) meet the additional classification requirement of S_a when tested to BS EN 1634-3:xxxx, *Fire resistance tests for door and shutter assemblies, Part 3- Smoke control doors.*
3. The National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class unless they have been tested accordingly.

Appendix E

DEFINITIONS

Page 126

Class 0: replace existing paragraph with:

"Class 0 A product performance classification for wall and ceiling linings. The relevant test criteria are set out in Appendix A, paragraph 13."

Page 128

Material of limited combustibility: replace existing paragraph with:

"Material of limited combustibility A material performance specification that includes non-combustible materials, and for which the relevant test criteria are set out in Appendix A, paragraph 9."

Non-combustible material: replace existing paragraph with:

"Non-combustible material The highest level of reaction to fire performance. The relevant test criteria are set out in Appendix A, paragraph 8."

Page 129

Thermoplastic material: replace existing paragraph with:

"Thermoplastic material See Appendix A, paragraph 17."

Appendix G

STANDARDS REFERRED TO

Page 132

Under Approved Document B1, add the following reference:

"BS EN 54-11 Fire detection and fire alarm systems - Part 11: Manual call points."

Page 134

At the end of the existing Appendix A, insert the following list:

"European test methods and classifications (Reaction to fire)

BS EN ISO 1182:2002, *Reaction to fire tests for building products - Non-combustibility test*

BS EN ISO 1716:2002, *Reaction to fire tests for building products - Determination of the gross calorific value*

BS EN 13823:2002, *Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item*

BS EN ISO 11925-2:2002, *Reaction to fire tests for building Products, Part 2-Ignitability when subjected to direct impingement of a flame*

BS EN 13238:2001, *Reaction to fire tests for building products-conditioning procedures and general rules for selection of substrates*

BS EN 13501-1:2002, *Fire classification of construction products and building elements, Part 1- Classification using data from reaction to fire tests*

European test methods and classifications (Fire resistance)

BS EN 1363-1:1999, *Fire resistance tests, Part 1-General requirements*

BS EN 1363-2:1999, *Fire resistance tests, Part 2-Alternative and additional procedures*

DD ENV 1363-3:1999, *Fire resistance tests, Part 3-Verification of furnace performance*

BS EN 1364-1:1999, *Fire resistance tests for non-loadbearing elements, Part 1-Walls*

BS EN 1364-2:1999, *Fire resistance tests for non-loadbearing elements, Part 2-Ceilings*

BS EN 1364-3:xxxx, *Fire resistance tests for non-loadbearing elements, Part 3-Curtain walls-full configuration*

BS EN 1364-4:xxxx, *Fire resistance tests for non-loadbearing elements, Part 4-Curtain walls-part configuration*

BS EN 1364-5:xxxx, *Fire resistance tests for non-loadbearing elements, Part 5-Semi-natural fire test for facades and curtain walls*

BS EN 1364-6:xxxx, *Fire resistance tests for non-loadbearing elements, Part 6-External wall systems*

BS EN 1365-1:1999, *Fire resistance tests for loadbearing elements, Part 1-Walls*

BS EN 1365-2:1999, *Fire resistance tests for loadbearing elements, Part 2-Floors and roofs*

BS EN 1365-3:1999, *Fire resistance tests for loadbearing elements, Part 3-Beams*

BS EN 1365-4:xxxx, *Fire resistance tests for loadbearing elements, Part 4-Columns*

BS EN 1365-5:xxxx, *Fire resistance tests for loadbearing elements, Part 5-Balconies*

BS EN 1365-6:xxxx, *Fire resistance tests for loadbearing elements, Part 6-Stairs and walkways*

BS EN 1366-1:1999, *Fire resistance tests for service installations, Part 1-Ducts*

BS EN 1366-2:1999, *Fire resistance tests for service installations, Part 2-Fire dampers*

BS EN 1366-3:xxxx, *Fire resistance tests for service installations, Part 3-Penetration seals*

BS EN 1366-4:xxxx, *Fire resistance tests for service installations, Part 4-Linear joint seals*

BS EN 1366-5:xxxx, *Fire resistance tests for service installations, Part 5-Service ducts and shafts*

BS EN 1366-6:xxxx, *Fire resistance tests for service installations, Part 6-Raised floors*

BS EN 1366-7:xxxx, *Fire resistance tests for service installations, Part 7-Closures for conveyors and trackbound transportation systems*

BS EN 1366-8:xxxx, *Fire resistance tests for service installations, Part 8-Smoke extraction ducts*

BS EN 1366-9:xxxx, *Fire resistance tests for service installations, Part 9-Single compartment smoke extraction ducts*

BS EN 1366-10:xxxx, *Fire resistance tests for service installations, Part 10-Smoke control dampers*

BS EN 13501-2:xxxx, *Fire classification of construction products and building elements, Part 2- Classification using data from fire resistance tests (excluding products for use in ventilation systems)*

BS EN 13501-3:xxxx, *Fire classification of construction products and building elements, Part 3-Classification using data from fire resistance tests on components of normal building service installations (other than smoke control systems)*

BS EN 13501-4:xxxx, *Fire classification of construction products and building elements, Part 4-Classification using data from fire resistance tests on smoke control systems.*

DD ENV 13381-1:xxxx, *Test methods for determining the contribution to the fire resistance of structural members, Part 1-Horizontal protective membranes*

DD ENV 13381-2:2002, *Test methods for determining the contribution to the fire resistance of structural members, Part 2-Vertical protective membranes*

DD ENV 13381-3:2002, *Test methods for determining the contribution to the fire resistance of structural members, Part 3-Applied protection to concrete members*

DD ENV 13381-4:2002, *Test methods for determining the contribution to the fire resistance of structural members, Part 4-Applied protection to steel members*

DD ENV 13381-5:2002, *Test methods for determining the contribution to the fire resistance of structural members, Part 5-Applied protection to concrete/profiled sheet steel composite members*

DD ENV 13381-6:2002, *Test methods for determining the contribution to the fire resistance of structural members, Part 6-Applied protection to concrete filled hollow steel columns*

DD ENV 13381-7:2002, *Test methods for determining the contribution to the fire resistance of structural members, Part 7-Applied protection to timber members*

European test methods and classifications (External fire exposure of roofs)

DD ENV 1187:2002, *Test methods for external fire exposure to roofs.*"

At the end of the existing Appendix B, insert the following list:

"BS EN 1634-1:2000, *Fire resistance tests for door and shutter assemblies, Part 1-Fire doors and shutters*

BS EN 1634-2:xxxx, *Fire resistance tests for door and shutter assemblies, Part 2-Fire door hardware*

BS EN 1634-3:xxxx, *Fire resistance tests for door and shutter assemblies, Part 3-Smoke control doors."*

Page 136

Replace the first publication reference in Appendix A with:

"Fire protection for structural steel in buildings (second edition-revised). ASFP/SCI/FTSG, 1992 (available from the ASFP, Association House, 99 West Street, Farnham, Surrey GU9 7EN and the Steel Construction Institute, Silwood Park, Ascot, Berks SL5 7QN)."

Replace the existing list of other publications referred to in Appendix B with the following list:

"*Hardware for timber and escape doors* published by the Builders Hardware Industry Federation in November 2000 is available from the BHIF, 42 Heath Street, Tamworth, Staffordshire, B79 7JH.

Code of practice for fire-resisting metal doorsets published by the DSMA (Door and Shutter Manufacturers' Association) in 1999 is available from DSMA, 42 Heath Street, Tamworth, Staffs B79 7JH.

Timber Fire Resisting Doorsets: maintaining performance under the new European test standard published by TRADA is available from TRADA Technology Limited, Stocking Lane, Hughenden Valley, High Wycombe, Bucks, HP14 4ND."

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