Department of the Environment and
The Welsh Office

The Building Regulations 1991

Fire safety

B

APPROVED DOCUMENT

B1	Means of escape
B2	Internal fire spread (linings)
B3	Internal fire spread (structure)
B4	External fire spread
B5	Access and facilities for the fire service

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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 tests on fire-resisting elements is given in the following publications:

Fire Protection Association
Fire test results on building products: fire resistance, 1983. (Available from the FPA, 140 Aldersgate Street, London ECIA 4HX).

Association of Structural Fire Protection Contractors and Manufacturers
Fire protection for structural steel in buildings, second edition,1988. (Available from the ASFPCM, PO Box 111, Aldershot, Hants, GU11 1YW).

Loss Prevention Council
Rules for the construction and installation of firebreak doors and shutters, 1988. (Available from the FPA, 140 Aldersgate Street, London ECIA 4HX).

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

Any reference used to substantiate the fire resistance rating of a construction 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 fixing method, joints, dimensions, etc) may significantly affect the rating.

Roofs

A6 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 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 that this is not the most recent version of the standard.

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 3 and 7.

Table A5 gives notional designations of some generic roof coverings.

Non-combustible materials

A7 Non-combustible materials are defined in Table A6 either as listed products, or in terms of performance when tested to BS 476: Part 4: 1970 or Part 11: 1982.

Only these materials may be used where there is a provision for non-combustibility and also for the specific applications in the elements listed in Table A6. Non-combustible materials may be used whenever there is a requirement for materials of limited combustibility.

Materials of limited combustibility

A8 Materials of limited combustibility are defined in Table A7 by reference to the method specified in BS 476: Part 11: 1982. 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

A9 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.

A10 To restrict the use of materials which ignite easily, which have a high rate of heat release and/or which reduce the time to flashover, maximum acceptable 'fire propagation' indices are specified. These are determined by reference to the method specified in BS 476: Part 6: 1981 or 1989. Index of performance (I) relates to the overall test performance, whereas sub-index (i_1) is derived from the first three minutes of test.

A11 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 or 1987 under which materials or products are classified 1, 2, 3 or 4 with Class 1 being the highest.

A12 The highest 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 subindex (i_1) of not more than 6.

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

A13 Composite products defined as materials of limited combustibility (see A8 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.

A14 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.

A15 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

A16 A thermoplastic material means any synthetic polymeric material which has a softening point below 200°C if tested to BS 2782: Part 1: Method 120A: 1976. Specimens for this test may be fabricated from the original polymer where the thickness of material of the end product is less than 2.5mm.

A17 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.

A18 Concessions are made for thermoplastic materials used for windows, rooflights, and lighting diffusers within suspended ceilings, which may not comply with the criteria specified in paragraphs A10 et seq. They are described in the guidance on requirements B2 and B4.

A19 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 A10 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 3mm thick;

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

iv. any other rigid thermoplastic product, a specimen of which, when tested to BS 2782: 1970 as amended in 1974: method 508A, 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 1mm thick which comply with the Type C requirements of BS 5867: Part 2 when tested to BS 5438, 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 3mm 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 3mm thick is tested in accordance with BS 2782: 1970, as amended in 1974: method 508A, has a rate of burning which does not exceed 50mm/minute. (If it is not possible to cut or machine a 3mm thick specimen from the product then a 3mm test specimen can be moulded from the same material as that used for the manufacture of the product).

Fire test methods

A20 A guide to the various test methods in BS 476 and BS 2782 is given in PD 6520: 1988 (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: 1982.