

7 Fire

Fire performance is regulated by Approved Document B (Fire safety). This calls up national standards for performance levels but these will be replaced by harmonised European Standards as they are produced. Currently, ISO 834 covers the agreed European fire resistance tests. The British Standard for fire performance is BS 476 (Fire tests on building materials and structures). This contains 33 parts, and parts 4 to 7 inclusive are directly relevant for plywood, parts 20 to 22 for the whole roof. The performance areas these parts of the standard address are: non-combustibility; ignitability; fire propagation; surface spread of flame; fire resistance of the elements of a structure.

The performance of plywood in these areas is shown in Table 6.

Although plywood is rated 'combustible' it achieves a 'not easily ignitable' classification. Plywood ignites at around 270 °C if a flame is present but spontaneous ignition does not occur until a temperature greater than 400 °C is reached. The slow, predictable charring rate of plywood in a fully developed fire, combined with relatively few joints between panels, means that plywood gives better fire performance than might be expected.

Plywood cannot be made non-combustible (all materials containing more than a small amount of organic material are combustible) but its resistance to the spread of flame can be improved. Treatment with a flame-retardant can allow plywood to achieve the Class 1 requirements of BS 476-7:1997. Plywood can be impregnated with flame-retardant chemicals into the finished board. Plywood which has already been installed can be surface treated with a flame-retardant paint or intumescent paint (intumescent materials froth at high temperatures).

These treatments do not make the plywood non-combustible and the fire resistance rating of the structure may not change either.

Table 6 Performance of plywood in the parameters of BS 476

Performance parameter	Relevant part of BS 476	Rating of plywood
Non-combustibility	Part 4 (1970)	Combustible
Ignitability	Part 5 (1979)	Not easily ignitable
Fire propagation (rate of heat release)	Part 6 (1989)	Does not meet requirements for class 0 Class 3 (density >400 kg m ⁻³)
Surface spread of flame	Part 7 (1987)	Class 4 (density <400 kg m ⁻³)
Fire resistance of elements	Parts 20 to 22 (1987)	Rating dependent on structure as well as components

8 Acoustics

Approved Document E (Resistance to the passage of sound) sets levels for the performance of walls and floors but not for roofs. Plywood can be used in combination with other materials in a design for sound insulation.

9 References

- [1] **Office of Standards Services, National Institute of Standards and Technology, USA** (formerly National Bureau of Standards). *Construction and Industrial Plywood*. Voluntary Product Standard PS1-95, 1995. Available from APA—the Engineered Wood Association, Bournemouth (address on page iv).
- [2] **Department of the Environment**. *English house condition survey: 1991*. London, HMSO, 1993.
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- [4] **Health and Safety Executive (HSE)**. *Management of Health and Safety at Work. Approved Code of Practice*. Reference no L21. London, HMSO, 1992.
- [5] **Timber Research and Development Association**. *Interim Technical Data Sheet for Eurocode 5. ITD1*. High Wycombe, TRADA, 1994.
- [6] **Building Research Establishment**. Wood preservatives: application methods. *BRE Digest* 378. Garston, CRC, 1993.
- [7] **British Wood Preserving and Damp-Proofing Association**. *BWPDA manual*. London, BWPDA, 1991.

Building Regulations

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Approved documents

Approved Document A: Structure (1992 edition). 1991.
 Approved Document B: Fire safety (1992 edition). 1991.
 Approved Document C: Site preparation and resistance to moisture (1992 edition). 1991.
 Approved Document E: Resistance to the passage of sound (1992 edition). 1991.
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Scottish Office, Environment Department. The Building Standards (Scotland) Regulations 1990. *Statutory Instrument* 1990 No 2179 (S 187). London, HMSO, 1990.

Approved documents

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 Part D: Structural fire precautions
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 Part J: Conservation of fuel and power

Department of the Environment for Northern Ireland. The Building Regulations (Northern Ireland) 1994. *Statutory Rules of Northern Ireland* 1994 No 243. Belfast, HMSO, 1994.

Approved documents

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