

Structural use of timber —

Part 6: Code of practice for timber frame walls —

Section 6.2: Buildings other than dwellings not exceeding four storeys

ICS 91.060.10; 91.080.20

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee B/525, Building and civil engineering structures, to Subcommittee B/525/5, Structural use of timber, upon which the following bodies were represented:

- British Woodworking Federation
- Construction User Group
- Department of the Environment, Transport and the Regions
- Health and Safety Executive
- Institution of Civil Engineers
- Institution of Structural Engineers
- National House-Building Council
- Trussed Rafter Association
- Timber Research and Development Association
- Timber Trade Federation
- United Kingdom Forestry Products Association

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Foreword

This section of BS 5268 has been prepared by Subcommittee B/525/5, Structural use of timber.

BS 5268 is published in the following parts and sections:

- *Part 2: Code of practice for permissible stress design, materials and workmanship;*
- *Part 3: Code of practice for trussed rafter roofs;*
- *Part 4: Fire resistance of timber structures;*
 - *Section 4.1: Recommendations for calculating fire resistance of timber members;*
 - *Section 4.2: Recommendations for calculating fire resistance of timber stud walls and joisted floor constructions;*
- *Part 5: Code of practice for the preservative treatment of structural timber;*
- *Part 6: Code of practice for timber frame walls;*
 - *Section 6.1: Dwellings not exceeding four storeys;*
 - *Section 6.2: Buildings other than dwellings not exceeding four storeys;*
- *Part 7: Recommendations for the calculation basis for span tables;*
 - *Section 7.1: Domestic floor joists;*
 - *Section 7.2: Joists for flat roofs;*
 - *Section 7.3: Ceiling joists;*
 - *Section 7.4: Ceiling binders;*
 - *Section 7.5: Domestic rafters;*
 - *Section 7.6: Purlins supporting rafters;*
 - *Section 7.7: Purlins supporting sheeting or decking.*

BS 5268-6.1 was first published in 1988 (with subsequent revisions) and covers the design of timber frame walls in dwellings up to four storeys in height.

In recent years the demand for timber frame structures for building other than dwellings has developed rapidly and it has been estimated that around 50 % of the output of the timber frame manufacturing industry is produced for non-domestic buildings.

This section of BS 5268 follows a similar methodology to BS 5268-6.1, but because of the demand for greater storey heights in non-domestic buildings, it is based upon an extensive range of tall wall panel racking tests carried out on wall panels up to 4.8 m in height. It is essentially written for buildings other than dwellings, but some of the information in respect of the performance of wall panels over 2.7 m in height may also be appropriate for use in the design of tall wall panels in dwellings.

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 18, an inside back cover and a back cover.

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Sidelining in this document indicates the most recent changes by amendment.

1 Scope

This section of BS 5268 gives recommendations for the design, testing, fabrication and erection of timber frame walls for buildings other than dwellings not exceeding four storeys in height and where the following conditions apply.

- a) The maximum overall height of any building is 15 m.
- b) The maximum panel height in a single storey building is 6.2 m.
- c) The maximum panel height in buildings of more than one storey is 4.8 m.

This section of BS 5268-6 gives recommendations for timber frame walls, with studs continuous in length throughout the panel height, not exceeding 610 mm centre to centre and one or both faces of the studs being partly or wholly connected to sheathing or lining. The design information contained in this section of BS 5268 is principally intended to cover storey height panel construction. Much of the information is also relevant to other forms of panel construction, for example, where studs are continuous through two or more storeys.

All structural materials are assumed to be subject only to service classes 1 and 2, as defined in BS 5268-2:1996.

The design information on the racking performance of tall wall panels (over 2.7 m in height), contained in this section of BS 5268-6, may also be relevant to the design of tall wall panels in dwellings. The design method described in this section of BS 5268-6 may be used in validating the racking performance of wall panels over 2.7 m in height for use in dwellings in combination with designs in accordance with the recommendations of BS 5268-6.1.

This section of BS 5268 covers only the structural design of timber frame walls. The following constructional features may significantly affect the basis of the design, and they are drawn to the attention of the designer:

- a) susceptibility to weathering;
- b) condensation control;
- c) thermal insulation;
- d) fire resistance;
- e) sound insulation;
- f) durability.

2 Normative references

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this part of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication applies.

BS 187, *Specification for calcium silicate (sandlime and flintstone) bricks.*

BS 1230-1, *Gypsum plasterboard — Part 1: Specification for plasterboard excluding materials submitted to secondary operations.*

BS 3921, *Specification for clay bricks.*

BS 4551:1980, *Methods of testing mortars, screeds and plasters.*

BS 4729, *Specification for dimensions of bricks of special shapes and sizes.*

BS 5268-2:1996, *Structural use of timber — Part 2: Code of practice for permissible stress design, materials and workmanship.*

BS 5268-3:1998, *Structural use of timber — Part 3: Code of practice for trussed rafter roofs.*

BS 5268-5:1989, *Structural use of timber — Part 5: Code of practice for the preservative treatment of structural timber.*

BS 5268-6, *Structural use of timber — Part 6: Code of practice for timber frame walls.*

BS 5268-6.1:1996, *Structural use of timber — Part 6: Code of practice for timber frame walls — Section 6.1: Dwellings not exceeding four storeys.*

BS 5390, *Code of practice for stone masonry*.

BS 5628-1:1992, *Code of practice for use of masonry — Part 1: Structural use of unreinforced masonry*.

BS 5628-2:1985, *Code of practice for use of masonry — Part 2: Structural use of reinforced and prestressed masonry*.

BS 5628-3, *Code of practice for use of masonry — Part 3: Materials and components, design and workmanship*.

BS 6073-1, *Precast concrete masonry units — Part 1: Specification for precast concrete masonry units*.

BS 6100 (all parts), *Glossary of building and civil engineering terms*.

BS 6399-1, *Loading for buildings — Part 1: Code of practice for dead and imposed loads*.

BS 6399-2, *Loading for buildings — Part 2: Code of practice for wind loads*.

BS 6399-3, *Loading for buildings — Part 3: Code of practice for imposed roof loads*.

BS 6446, *Specification for manufacture of glued structural components of timber and wood based panel products*.

BS 6457, *Specification for reconstructed stone masonry units*.

BS 6649, *Specification for clay and calcium silicate modular bricks*.

BS EN 300:1997, *Oriented strand board (OSB) — Definitions, classification and specifications*.

BS EN 312-5:1997, *Particleboards — Specifications — Part 5: Requirements for load-bearing boards for use in humid conditions*.

BS EN 312-7:1997, *Particleboards — Specifications — Part 7: Requirements for heavy duty load-bearing boards for use in humid conditions*.

BS EN 336, *Structural timber — Coniferous and poplar — Sizes — Permissible deviations*.

BS EN 385, *Finger jointed structural timber — Performance requirements and minimum production requirements*.

BS EN 594:1996, *Timber structures — Test methods — Racking strength and stiffness of timber frame wall panels*.

BS EN 622-2:1997, *Fibreboards — Specifications — Part 2: Requirements for hardboards*.

BS EN 622-3:1997, *Fibreboards — Specifications — Part 3: Requirements for medium boards*.

BS EN 622-4:1997, *Fibreboards — Specifications — Part 4: Requirements for softboards*.

BS EN 634-2:1997, *Cement bonded particleboards — Specifications — Part 2: Requirements for OPC bonded particle boards for use in dry, humid and exterior conditions*.

DD ENV 1995-1-1:1994, *Eurocode 5 — Design of timber structures — General rules and rules for buildings (together with United Kingdom National Application Document)*.

3 Terms and definitions

For the purposes of this section of BS 5268 the following terms and definitions apply.

3.1

cripple stud

vertical member in a framed partition or wall that supports a lintel

3.2

racking resistance

ability of a partition or wall panel to resist horizontal wind forces in the plane of the panel

3.3

gable apex panel

wall panel forming the apex of a gable

3.4**stud**

vertical member in a framed partition or wall

3.5**timber frame wall**

wall constructed of timber framing members, bracing and/or wall sheathing

3.6**wall lining**

manufactured sheet or board used to line a wall or partition

3.7**wall panel**

component that forms part of a timber frame wall

3.8**wall sheathing**

sheet or board used as a bracing

4 Materials**4.1 General**

The materials used should conform to the appropriate British Standards.

Reference should be made to BS 5268-5 for information on methods of wood preservation.

All sheathing and lining materials should be of a thickness and robustness so that damage during manufacture, transport and erection is avoided.

4.2 Species of timber

All structural timber should be strength graded in accordance with the recommendations of BS 5268-2.

NOTE Any of the species of timber listed in BS 5268-2 may be used.

4.3 Sheathing materials**4.3.1 Plywood**

The species and grades of plywood for sheathing should be one of those described in BS 5268-2.

4.3.2 Fibre building boards

Fibre building boards for use as structural sheathing should be one of the following types:

- a) type HB.HLA2 tempered hardboard conforming to BS EN 622-2:1997;
- b) type MBH.HLS1 or MBH.HLS2 medium board conforming to BS EN 622-3:1997;
- c) impregnated softboard type SB.HLS conforming to BS EN 622-4:1997.

4.3.3 Wood chipboard

Wood chipboard sheathing should be type P5 conforming to BS EN 312-5:1997 or type P7 conforming to BS EN 312-7:1997.

4.3.4 Oriented strand board

Oriented strand board for sheathing should be type OSB/3 or OSB/4 conforming to BS EN 300:1997.

4.3.5 Cement bonded particleboard

Cement bonded particleboard should be type OPC bonded conforming to BS EN 634-2:1997.

4.3.6 Other sheathings

Where sheathings other than those described in 4.3.1, 4.3.2, 4.3.3, 4.3.4 and 4.3.5 are to be used they should conform to the relevant British or European Standard.

The durability of any wall sheathing material with a view to its intended end use should be ensured.

4.4 Gypsum plasterboard

Where gypsum plasterboard is assumed to make a structural contribution in the design of a timber frame wall, the plasterboard should be manufactured in accordance with BS 1230-1.

4.5 Adhesives

Adhesives used in the construction of timber frame wall panels should be of a type and quality suitable for the conditions of use.

NOTE Further advice on suitable adhesives and the quality of workmanship is given in BS 5268-2 and BS 6446.

4.6 Fasteners

Structural fasteners should be corrosion resistant and should be compatible with any preservative treatments used and any other metalwork with which they are in contact.

In the construction of panels and for fixing sheathing mild steel or stainless steel nails should be used, of round head or D-head configuration, and the size to be used should be given in the design.

4.7 Masonry cladding

Where masonry cladding to be used for shielding the timber frame or to contribute to the racking resistance of a timber frame wall it should be designed in accordance with the appropriate part of BS 5628 or BS 5390 for stone masonry and should be at least 100 mm thick and have a minimum density of 750 kg/m³.

5 Loading

5.1 General

Timber frame walls should be designed to carry the appropriate dead, imposed and wind loads given in BS 6399-1, -2 and -3 and to transfer such loads to the foundation without undue distortion and movement.

5.2 Wind loading

5.2.1 Distribution of wind load

Wind acting on a building induces external and internal pressures on the roof and walls, as described in BS 6399-2. Both horizontal and vertical loads thus developed should be considered in the design of timber frame walls.

NOTE The wind load is resisted primarily by transfer directly to the ground at the base of the wall and by the racking resistance of timber frame supporting walls, the load having been transferred via the floor and ceiling diaphragms. Other non-specific factors assisting in the resistance to wind loads are taken into account in the interaction factor given in 5.2.3.