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Specification for

Inclusion of glass in the construction of furniture, other than tables or trolleys, including cabinets, shelving systems and wall hung or free standing mirrors

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Committees responsible for this British Standard

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- Association for Consumer Research (ACRE)
- British Association for Accident and Emergency Medicine
- British Contract Furnishing Association
- British Furniture Manufacturers' Federation
- British Shops and Stores Association (BSSA)
- Child Accident Prevention Trust
- Consumer Policy Committee of BSI
- Department of Trade and Industry (Consumer Safety Unit, C A Division)
- EEA (The Association of Electronics, Telecommunications and Business Equipment Industries)
- Faculty of Medicine, Leeds University
- Flat Glass Manufacturers' Association
- Furniture Industry Research Association
- Glass and Glazing Federation
- Ice (Ergonomics)
- Institute of Trading Standards Administration
- Royal Society for the Prevention of Accidents
- Society of Glass Technology

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Foreword

This British Standard has been prepared under the direction of the Consumer and Contract Goods Standards Policy Committee at the request of the Department of Trade and Industry's Consumer Safety Unit. The purpose of this British Standard is to provide designers, manufacturers, retailers, consumers and other interested parties with requirements that should minimize the risks of serious accidents with glass included in the construction of furniture other than tables or trolleys, including cabinets, shelving systems and wall hung or free standing mirrors, and it complements BS 7376. It is anticipated that BS 6250-3 will be amended to require that, when glass is included in the construction of cabinet furniture, the cabinet furniture will comply with this British Standard.

The safety requirements for glass in kitchen cabinets are now contained in BS EN 1153:1996 and have therefore been removed from the scope of this standard. It should be noted that the UK voted against EN 1153 at the formal vote stage with the following comment.

Research undertaken has shown by modelling and laboratory testing that the impact test for vertical glass components as currently specified is not adequate to ensure that serious accident to adults and children will be prevented.

In this respect it should be noted that meeting the requirements for glass in cabinets of BS 7449 will cover the much less demanding requirements of BS EN 1153 but not vice versa. Attention is therefore drawn to the General Product Safety Regulations: 1994, which places a general duty on suppliers of consumer goods to supply products that are safe.

This British Standard calls for the use of test procedures that may be injurious to health if adequate precautions are not taken by the person carrying out the test. It in no way absolves those responsible for testing from statutory obligations relating to health and safety.

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 12, an inside back cover and a back cover.

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1 Scope

This British Standard specifies general requirements, performance requirements and thickness requirements necessary to ensure reasonable safety of flat glass, greater than 0.06 m², included in the construction of furniture other than tables or trolleys, including cabinets, shelving systems, wall hung or free standing mirrors, storage furniture and bathroom cabinets but excluding catering furniture. The standard takes account of the foreseeable use of the furniture, shelving system or mirror.

This standard does not apply to glass in kitchen cabinets. The safety requirements for glass in kitchen cabinets are contained in BS EN 1153:1996.

NOTE 1 The titles of the publications referred to in this standard are listed on the inside back cover.

NOTE 2 This standard does not cover glass under 0.06 m², but this does not imply glass under 0.06 m² is considered safe in all circumstances. Potential hazards will depend on the application which, for small sections of glass, cannot be fully predicted in a general standard such as this. Attention is therefore drawn to the General Product Safety Regulations 1994 [1] which place a general duty on suppliers of consumer goods to supply products that are safe in normal or reasonably foreseeable use.

2 Definitions

For the purposes of this British Standard the following definitions apply.

2.1

unbacked glass

glass which either has no backing immediately behind its entire area or has a backing that does not retain its integrity or is cracked or broken when tested as described in appendix A

NOTE Vertical glass that is parallel to and less than 25 mm from a wall, when in the intended position of use, is not classed as unbacked glass.

2.2

enclosed shelf

shelf that is completely enclosed within the cabinet when the cabinet doors are closed

2.3

annealed glass

glass which has been heated to the annealing temperature to remove internal stresses and cooled under controlled conditions

NOTE 1 When broken, annealed glass tends to break into dagger-like shards.

NOTE 2 Annealed glass is sometimes referred to as ordinary glass.

2.4

toughened glass

glass, the surface of which has been rapidly cooled from near the softening point so that a residual compressive stress remains in the surface after complete cooling

NOTE 1 This process increases the thermal and mechanical strength of glass and tends to make it shatter into smaller and less angular fragments than an ordinary glass when it is subject to a breaking stress.

NOTE 2 Toughened glass is also known as tempered glass.

2.5

laminated glass

two or more layers of glass permanently bonded together by one or more interlayers of plastics, and considered as one piece of glass

NOTE The fracture characteristics of laminated glass are similar to those of the type of glass present in the laminate. Impact energy can be absorbed by the interlayers of plastics intended to hold together pieces of glass when broken.

2.6

film backed glass

glass to which a film of flexible plastics has been applied

NOTE The film is intended to hold together pieces of glass if broken.

2.7

cast glass

glass manufactured by the rolling process

NOTE Cast glass is also known as patterned glass.

2.8

nominal thickness

thickness of glass prior to edge working or surface decoration

2.9

decorated glass

glass, the surface of which has been worked (e.g. by acid etching or embossing, sandblasting, brilliant cutting or engraving) to give a decorative effect (see BS 3447) or has been fired with enamels or screen printed

3 Edge work, bevelling and drilling

Exposed edges of glass shall be edge worked or bevelled (see Table 1 of BS 952-2:1980).

The edge of laminated or film backed glass shall be protected from moisture.

NOTE 1 Manufacturers should follow the recommendations given in appendix B.

NOTE 2 If the glass is to be fixed with screws the furniture manufacturer should consult the glass processor or supplier regarding the location and size of holes and the proposed washer system (see E.2).

4 Film backed glass

When film backed glass is used the glass surface shall be the working surface.

5 Horizontal glass supported over its entire area

5.1 Glass which has an area no greater than 1.5 m² shall comply with the relevant nominal thickness given in Table 1. Glass which has an area greater than 1.5 m² shall be either toughened glass with a nominal thickness of at least 4 mm or laminated glass with a nominal thickness of at least 4.4 mm.

5.2 When annealed glass is used the furniture, with the glass removed but a non-structural compensating weight equivalent to that of the glass replacing the glass, shall pass the horizontal static load, vertical impact and horizontal fatigue tests given in BS 4875-5 at test level 3.

NOTE The interpretation of results is explained in BS 4875-5.

6 External glass surfaces excluding horizontal glass supported over its entire area

NOTE 1 Examples of external glass surfaces include glass doors, mirror doors, mirrors and glass panels.

NOTE 2 Glass suppliers should be consulted regarding which of the alternative types of glass is most appropriate for a given application.

6.1 Unbacked glass, including mirrors, with a minor dimension of less than 900 mm shall comply with Class C of BS 6206. When fully framed, the glass shall have a nominal thickness (see 2.8 and clause 9) of at least 3 mm; when partially framed or unframed the glass shall have a nominal thickness of at least 4 mm.

6.2 Unbacked glass, including mirrors, with a minor dimension of 900 mm or greater shall comply with Class B of BS 6206. When fully framed the glass shall have a nominal thickness (see 2.8 and clause 9) of at least 4 mm; when partially framed or unframed the glass shall have a nominal thickness of at least 6 mm.

6.3 Where static or sliding glass is contained in a rebate or groove, the overlap of the rebate or groove with the glass shall be at least 4 mm and shall be equal to or greater than the nominal thickness of the glass.

7 Hinged doors, lids or flaps incorporating glass whether framed or unframed

When a hinged component incorporating glass is tested by the methods described in appendix C, there shall be no damage to the glass and the component shall not become wholly or partially detached from the unit either by structural failure of a hinge or slippage in a hinge mounting.

8 Glass shelves

8.1 Maximum safe load

The maximum evenly distributed safe load of a glass shelf when determined in accordance with appendix D shall be equal to or greater than the load stated by the manufacturer and marked on the label (see 12.3).

8.2 Support of glass shelves

8.2.1 When the glass is moved to extreme positions in any direction horizontally it shall overlap all supports simultaneously by at least 4 mm. Furniture with doors shall comply with this requirement with its doors open.

8.2.2 A shelf shall be retained when the furniture or shelving system of which it is part is tilted in any direction by $30 \pm 2^\circ$ to the horizontal (see Figure 1). Furniture with doors shall comply with this requirement with the doors open.

8.2.3 A shelf shall not tip and the supports shall remain intact when a load, equivalent to 50 % of the maximum evenly distributed safe load (see 8.1) and covering an area of 75 mm × 75 mm, is placed at any position on it for at least 10 s.

8.3 Shelves that are not enclosed shelves (see 2.2)

Glass shelves that are not enclosed shelves shall comply with Class C of BS 6206.

Table 1 — Nominal thickness of horizontal glass that is supported over its entire area

Area of glass	Nominal thickness requirement (see 2.8 and clause 9)			
	Annealed glass	Toughened glass	Laminated glass	Film backed glass
m ²	mm	mm	mm	mm
≤ 0.5	≥ 4.0	≥ 4.0	≥ 4.4	≥ 4.0
> 0.5 to ≤ 1.0	≥ 5.0	≥ 4.0	≥ 4.4	≥ 4.0
> 1.0 to ≤ 1.5	≥ 6.0	≥ 4.0	≥ 4.4	≥ 4.0
> 1.5	See 5.1	≥ 4.0	≥ 4.4	See 5.1