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Glass and Glazing Federation

SAFETY AND SECURITY
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The Right Glazing in the Right Place

It is a legal requirement to install the right glazing in the right place. This will save lives.

Glass and Glazing Federation

The Glass and Glazing Federation (GGF) is the recognised leading authority for employers and companies within the flat glass, glazing, home improvement, plastics and window film industries. GGF Members can be found in over 1,500 business locations throughout the U.K.

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The Right Glazing in the Right Place: Use of safety glazing in critical locations

Glazing in part of a door, wall or other part of a building likely to be subject to accidental human impact.

The Building Regulations in England, Wales, Scotland and Northern Ireland have had requirements for 'Glazing subjected to human impact' since the early 1990s. The appropriate documents are as follows:

- England Approved Document K: 2013
- Wales Approved Document N: 1998
- Scotland Technical Handbook 4.8
- Northern Ireland Part V1

NOTE 1: England – Approved Document K: 2013; Safety glazing is covered in K4 and manifestation of glazing K 5.2

NOTE 2: Wales – Approved Document N – formerly England & Wales Approved Document N – 1998 incorporating 2000 and 2010 amendments

The details of the requirements are incorporated into: BS 6262 Part 4:2005 Glazing for buildings – Part 4: Code of practice for safety related to human impact.

General

BS 6262 – Part 4 takes into account the following:

The publication of harmonised European standards (hENs) for glass products;
Withdrawal of BS 6206: *Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings.* For testing of flat safety glass.
The publication of BS EN 12600; *Glass in building-pendulum test-impact test method and classification for flat glass.*

Definitions

(see BS 6262-4 - clause 3)
The following definitions apply:

Safety glass
Glass product conforming to;-
EN 572-3 – *Glass in building – Basic soda-lime silicate glass products – Part 3: Polished wired glass*

EN 572-6 – *Glass in building – Basic soda-lime silicate glass products – Part 6: Patterned wired glass*

EN 12150-1 *Glass in building – Thermally toughened soda-lime silicate safety glass – Part 1: Definition and description*

EN ISO 12543-2 – *Glass in building – Laminated glass and laminated safety glass – Part 2: Laminated safety glass*

EN 14179-1 – *Glass in building – Heat soaked thermally toughened soda-lime silicate safety glass – Part 1: Definition and description*

EN 13024-1 *Glass in building – Thermally toughened borosilicate silicate safety glass – Part 1: Definition and description that has a performance classification in accordance with EN 12600*

Safety plastics
Plastics glazing sheet material that has been classified in accordance with BS 6206

Unbacked mirror glazing
Glazing which has either no backing or only partial backing behind its entire area, or has a backing that does not retain its integrity or is cracked or broken when tested as described in BS 7449: 1991 *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.*

Safety film
The European standard for 'Adhesive backed polymeric filmed glass' is under preparation. This product can be tested and classified in accordance with EN 12600 and can therefore be regarded as a safety glass.

Impact performance / Marking

Impact performance

(see BS 6262: *Part 4 – clause 6*)

Safety glass

Is tested and classified in accordance with EN 12600. The classification is as follows:

$$\alpha\ (\beta)\ \Phi$$

Where:
α is the drop height at which the product either did not break or broke safely.

β is the mode of breakage of the material.

Φ is the drop height at which the product either did not break or broke in the fashion of laminated glass i.e. the broken glass offers containment.

Safety plastics

Is tested and classified in accordance with BS 6206.

Marking

(see BS 6262: *Part 4 – clause 7*)

General

Installed safety glass and safety plastics, in critical locations, shall be indelibly marked in such a position so that the marking is visible after installation.

Safety glass

Installed safety glass shall be clearly and indelibly marked with the following:
The name or trade mark of the manufacturer, merchant or installer;
The identifier of the product standard that the safety glass conforms to e.g. EN 12150, EN 14449 *Glass in building – laminated glass and laminated safety glass – evaluation of conformity/product standard. etc.*
The classification according to EN 12600.

Safety film

Adhesive backed polymeric filmed glass should be marked as follows:
Name or trade mark of manufacturer, merchant or installer;
F – for filmed glass;
EN 12600 and classification.
BS 6262-4:2005 requires only the first part of the marking designation. However, the full designation might be required to meet other regulatory requirements.

Attention is drawn to the Building Regulations for all regions within the United Kingdom.

Safety plastics

Safety plastics shall be marked in accordance with BS 6206: 1981; clause 6.

Table 1

Recommendations on class of safety glass or safety plastics to be used in critical locations

Critical location		Minimum recommended classification	
		Safety glass [a]	Safety plastics [a]
Doors (see clause 8.2)	Minor dimension of pane > 900 mm	2(β)Φ	Class B
	Minor dimension of pane ≤ 900 mm	3(β)Φ	Class C
Door side panels (see clause 8.3)	Minor dimension of pane > 900 mm	2(β)Φ	Class B
	Minor dimension of pane ≤ 900 mm	3(β)Φ	Class C
Low level glazed areas (see clause 8.4)	Irrespective of pane dimensions	3(β)Φ	Class C
Fully backed mirror glazing (see clause 8.5a)	Minor dimension of pane > 900 mm	2(β)Φ	Class B
	Minor dimension of pane ≤ 900 mm	3(β)Φ	Class C
Unbacked mirror glazing accessible from one side only (see clause 8.5b)	Minor dimension of pane > 900 mm	2_0(β)Φ b	Class B0
	Minor dimension of pane ≤ 900 mm	3_0(β)Φ b	Class C0
Bathing areas (see clause 8.7)	Irrespective of pane dimensions	3(β)Φ	Class C
Areas of special risk (see clause 8.8)	Irrespective of pane dimensions	3(β)Φ	Class C

[a] The second and third parts of the EN 12600 classification, ie (β)Φ, are not required for the classification of safety glass in this British Standard.
[b] In these locations the safety glass is only required to be tested and classified from the face that, when installed, is likely to be impacted. The safety glass should be marked with the classification 2_0 or 3_0 respectively, see clause 7.
[c] These classifications are taken from BS 6206.

Table 2

Nominal thickness and maximum pane size dimensions for glass not classified in accordance with EN 12600 that may be used in specific critical locations with four edges supported (see BS 6262: Part 4 - clause 8.4b)

NOTE: BS6262: Part 4 clause 8.4b Only applies if the pane forms part of a frontage of a building e.g. shopfront that is not a dwelling, in which case glass recommended in Table 2 may be used.

Normal thickness [a]	Maximum pane size dimensions
8mm	1100mm x 1100mm
10mm	2250mm x 2250mm
12mm	4500mm x 4500mm
15mm or thicker	no limits

a See BS 952-1. *Glass for glazing Part 1: Classification*

This leaflet outlines the recommended glazing to use in major 'risk areas'. For example as detailed in the Building Regulations England, i.e. Approved Document K: 2013 Edition: Part K2 Protection from falling; Part K4 Protection against impact with glazing; Part K5 Additional provisions for glazing in buildings other than dwellings.
The leaflet is also based on British Standard Code of Practice BS 6262 Part 4: 2005.
NOTE: Scotland Technical Handbook 4.8 calls up BS 6262: Part 4 2005 as a deemed to satisfy requirement

Critical location (BS 6262: Part 4 – Clause 8)

General

Those areas of internal and external walls, see Figure 1, that are considered 'critical locations' in terms of safety are:

a) Between the finished floor level and 1500mm above that level in doors, and in side panels which are within 300mm of either edge of the door;

b) Between the finished floor level and 800mm above that level in the case of windows not included in a) above;

c) Mirrored doors and panels

It is important to note that any part of a glass area affected must meet the requirements in its entirety and not just in the relevant section.

Table 1 gives the minimum recommended safety glass and safety plastics for use in all critical locations.

Exceptions

There are instances where glazing other than safety glass and safety plastics are deemed to be satisfactory:

Small Panes

Ordinary annealed glass may be used in small panes up to a maximum width of 250mm and an area not exceeding 0.5m^2. Such glass must not be less than 6mm in thickness, except in the case of traditional leaded lights and copper lights, where 4mm can be used.

Robustness

Robustness refers to the strength of the glazing that forms fronts to non-domestic buildings such as shops, showrooms, offices, factories and public buildings. Some glazing such as polycarbonate is inherently strong.

Annealed glass that does not normally comply with EN 12600 can gain robustness with increased thickness. Annealed glass may only be used in critical locations, therefore, when the nominal thickness and dimensions are as listed in Table 2.

Permanent Screen Protection

If glazing in a critical location is protected by a suitably designed protective screen system the recommendations of clause 8 do not apply.
The protective screen should:

a) be independent of the glazing;

b) prevent a sphere of 75mm diameter from touching the glazing (see Figure 2);

c) if 900mm or more in length, it should be sufficiently robust to sustain a centrally applied force of at least 1350 N, (1100 N, if less than 900mm in length) without:

1) fracturing;

2) deflecting so as to impact the glass;

3) permanently distorting;

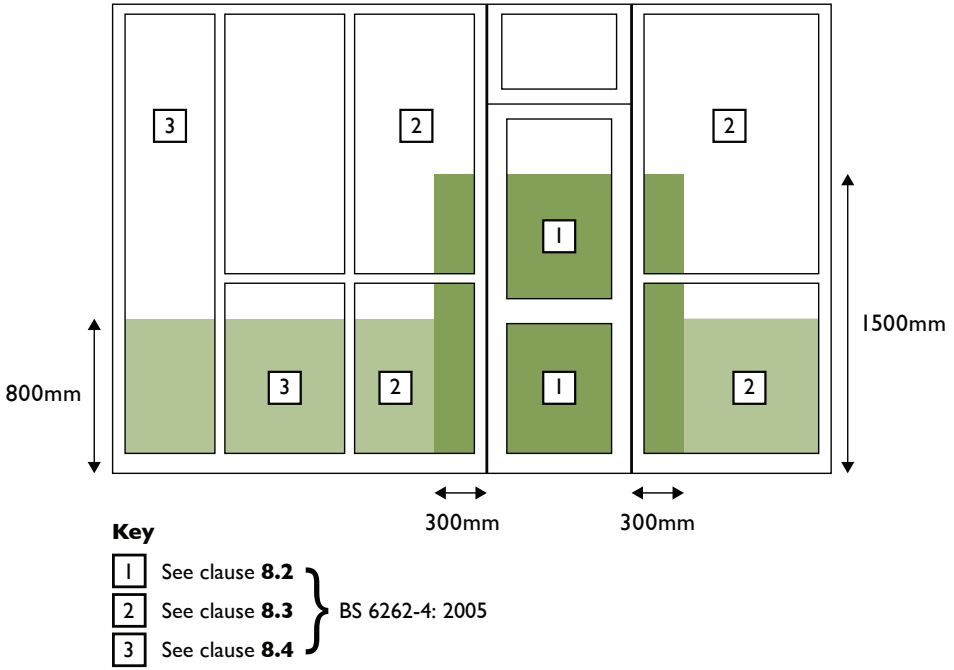
4) being displaced.

If the protective system is multi-railed, each rail must satisfy this recommendation.

If the glazing is installed behind a permanent robust screen, it need not itself comply with any other safety requirements provided the protected screen would prevent a sphere of 75mm diameter coming into contact with the glazing.

Figure 1

Critical Locations



Other considerations

Areas of Special Risk

In all those parts of buildings where the planned activity generates a special risk, for example indoor sports facilities, all glazing should conform to Table 1 within BS 6262 Part 4:2005. In these situations, the designer or specifier should consider if a higher class is required, or if additional safeguards such as protective rails or screens, or manifestation, are necessary

Glazing in Bathing Areas

Any glazing forming part of a bath or shower screen, or located adjacent to, or surrounding, a bath, swimming pool, or other associated wet area, constitutes a potential danger because of the possibility of a person slipping on a wet surface. Such glazing should consist of a material recommended for bathing areas as specified in Table 1, unless this British Standard recommends that material of a higher class should be used (see 8.2 and 8.3).

Glazing for prefabricated shower enclosures and shower cabinets should also conform to EN 14428 *Shower enclosures – functional requirements and test methods.*

Protective barriers

Glazing in protective barriers should conform to BS 6180:2011 *Barriers in and about buildings – code of practice.*

Safety glass should be classified in accordance with EN 12600:2002 and safety plastics should conform to BS 6206:1981.

For more detailed information see GGF Data Sheet 7.2: Guidelines for the Use of Glass in Protective Barriers.

Glazing in Non-Domestic Buildings

Under some conditions of lighting, large areas of transparent glazing used to subdivide a building might not be readily apparent. The risk of human impact with this glazing is greatest if adjacent areas within or immediately outside the building are at the same level so that a person might reasonably assume unimpeded passage from one part to another.

If the presence of such glazing is not sufficiently well indicated by mullions, transoms, door frames, large door handles, stall risers or other components of the glazing system, it should be made apparent by some form of manifestation.

The manifestation employed should be of a sufficient size to make it immediately obvious. It can take the form of broken or solid lines, patterns or company logos, positioned between 600mm and 1500mm above floor level at appropriate horizontal intervals. The manifestation should preferably be permanent, e.g. etching of the glazing, but alternatively, if applied materials are used they should be durable and not easily removed.

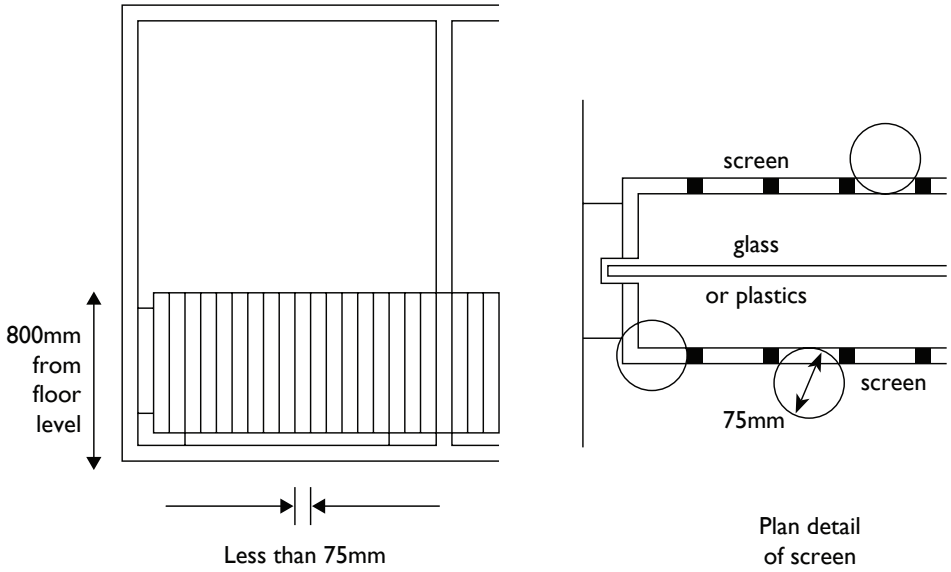
Further information can be found in the applicable Building Regulations, e.g. Approved Document K – 2013 Edition – For use in England – Section K5.2

Existing Glazing

The Workplace (Health Safety and Welfare) Regulations. The criteria and requirements of Regulation 14 impose the same requirements for existing glazing retrospectively; 'Every window or other transparent or translucent surface in a wall or partition and every transparent or translucent surface in a door or gate shall, where necessary for reasons of health and safety be of safety material or be protected against breakage of the transparent or translucent material and be appropriately marked or incorporate features to make it apparent.

Figure 2

Permanent screen protection



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