

Glass and Building Regulations

Impact Safety

England and Wales
Approved Document N

Scotland
Part P

Northern Ireland
Part V



PILKINGTON

Foreword

For new buildings, and for buildings subject to major refurbishment, glazing requirements for critical locations are given in a combination of Building Regulations and British Standards publications.

The relevant Building Regulations are:

- The Building Regulations England and Wales 1991 Part N ‘Glazing – materials and protection’. Approved Document N Glazing – materials and protection, 1992 edition, gives technical guidance
- The Building Standards (Scotland) Regulations 1990, Part P Miscellaneous Hazards. The November 1996 amendment to the 1990 Technical Standards Document provides guidance on the interpretation of the requirements
- The Building Regulations Northern Ireland 1994 Part V ‘Glazing’. Technical Booklet V ‘Glazing’, June 1994 gives technical guidance

There are two relevant British Standards:

- BS 6206: 1981 ‘Specification for Impact Performance Requirements for Flat Safety Glass and Safety Plastics for use in Buildings’
- BS 6262: ‘Code of practice for glazing for buildings’ Part 4: 1994 ‘Safety related to human impact’

The various Building Regulations and British Standards have been written separately and at different times. As a result of this, even though the intentions may be the same, the wording and presentation will vary.

However, if the recommendations in BS 6262: ‘Code of Practice for Glazing in Buildings’ Part 4: 1994 ‘Safety related to human impact’ are followed, the current requirements of Building Regulations in all three regional areas of the UK for the glazing of critical locations will be satisfied.

Where glazing may also perform the function of guarding (protection against falling through) then the recommendation of the following regulations should also be considered:

- England and Wales – ‘The Building Regulations 1991 Part K Stairs Ramps and Guards’
- Scotland – ‘The Building Standards (Scotland) Regulations 1990 Part S Stairs Ramps and Protective Barriers’
- Northern Ireland – ‘The Building Regulations Northern Ireland 1994 Part H Stairs Ramps and Guarding’

Impact Performance

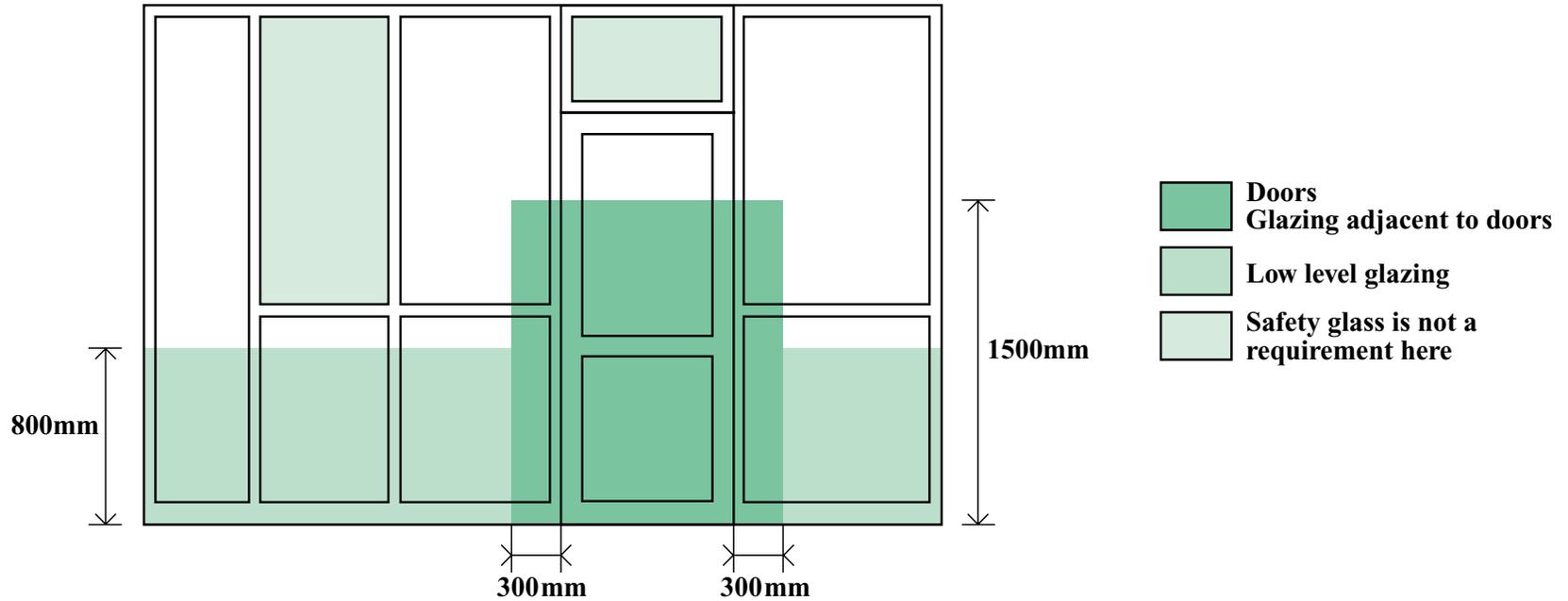


Figure 1. Critical Locations (in BS 6262: Part 4).

Glass and plastics materials, which are intended for use as safety glazing materials in critical locations in buildings where human impact can occur, should be classified according to their performance when subjected to a series of pendulum tests.

The impact test utilises a lead shot-filled leather bag weighing 45kg dropped like a pendulum from different heights.

Details of the impact test are given in BS 6206: 1981 'Specification for Impact Performance Requirements for Flat Safety Glass and Safety Plastics for use in Buildings'.

There are three safety glazing classifications: A (the highest), B, and C (the lowest).

- Pilkington Toughened Safety Glass would always obtain a Class A classification
- Pilkington Laminated Safety Glass with a PVB (polyvinylbutyral) or CIP (cast-in-place) interlayer would normally achieve at least a Class B classification depending on the glass and interlayer thickness. *Further information is given in the Pilkington Data Sheet 'Pilkington Laminated Safety Glass.'*
- Wired glass such as Pilkington **Pyroshield** Safety Glass would obtain a Class C classification

Glasses meeting these requirements and intended for use as safety glasses must be permanently marked as conforming to BS 6206

England and Wales

Approved Document N states that the Regulation will be satisfied if glazing in "critical locations" is designed to limit the risk of injury.

Critical Locations

These are defined either directly or in the Regulation Documents.

Note: the Building Regulations are only concerned with glazing which forms part of the building structure whereas BS 6262: Part 4: 1994 sets standards for other locations in addition, such as shower screens, shower cubicles, mirror glazing for cupboards and wardrobes.

The following locations should be regarded as critical:

- Between finished floor level and 800mm above it
- Between finished floor level and 1500mm above if in doors or side panels close to either edge of a door

(See figure 1)

Satisfying The Requirement In Critical Locations

1 Glazing in Doors

Glazing in doors which is wholly or partially within 1500mm from floor level shall be:

Minimum Class C to BS 6206 and **marked** according to BS 6206.

If the smaller dimension of the pane is greater than 900mm it shall be:

Minimum Class B to BS6206 and marked according to BS6206.

2 Glazing Adjacent to Doors

Glazing which is wholly or partly within 300mm of the edge of a door and which is wholly or partially within 1500mm from floor level shall be:

Minimum Class C to BS 6206 and marked to BS 6206.

If the smaller dimension of the pane is greater than 900mm it shall be:

Minimum Class B to BS 6206 and marked according to BS 6206.

3 Low Level Glazing (excluding guarding) not covered by 1 or 2

Glazing which is wholly or partially within 800mm of the floor level shall be:

Minimum Class C to BS 6206 and marked according to BS 6206.

There are some exceptions (see box) to these requirements for safety glass, based on the robustness of annealed glass.

Exceptions

- Panes having the smaller dimension less than 250mm and of area less than 0.5m^2 may be minimum 6mm (nominal) thick glass not complying with BS 6206.
- Panes forming parts of fronts (but not other locations) to shops, showrooms, offices, factories and public buildings, supported on all edges, may be of equivalent robustness not complying with BS 6206:
 - 8mm must not exceed 1100 x 1100mm
 - 10mm must not exceed 2250 x 2250mm
 - 12mm must not exceed 3000 x 4500mm
 - 15mm (and thicker) – no limit
- Panes protected by a suitably designed barrier

Permanent Screen Protection

Glazing in critical situations may be protected by a suitably designed protective screen in which case the glazing does not need to meet the requirements given before.

The screening should be designed in such a way that:

- It is independent of the glazing
- It will prevent a sphere of 75mm diameter from touching the glass
- If 900mm or more in length, it is sufficiently robust to sustain at least a centrally applied force of 1350 N (1100 N if less than 900mm in length) without:
 - Fracturing
 - Deflecting so as to impact the glass
 - Permanently distorting
 - Being displaced

If the screening system is multi-railed, each rail should satisfy this recommendation. The screen should not be climbable.

Safe opening and closing of windows and safe access for cleaning

Amendments to Part N in 1998 introduced requirements that windows, in buildings other than dwellings, should be safe to operate and have safe access for cleaning. The Approved Document gives guidance. There is no specific performance requirement for the glazing.

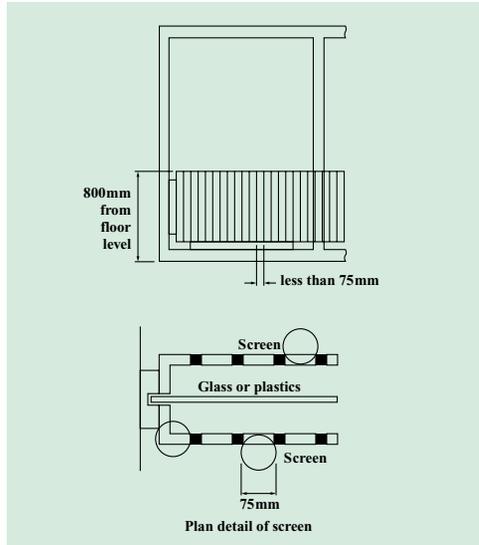


Figure 2. Permanent screen protection

Manifestation

Large areas of transparent glazing used to subdivide a building may not be immediately apparent, particularly under certain lighting conditions.

People in passage in or about the building may not be aware of the glazing and may collide with it.

The glazed areas referred to include large uninterrupted areas of transparent glazing which form, or are part of, the internal or external walls and doors of shops, showrooms, offices, factories, public and other non-domestic buildings. Permanent manifestation is only necessary when other means of indicating the presence of the glazing are not present.

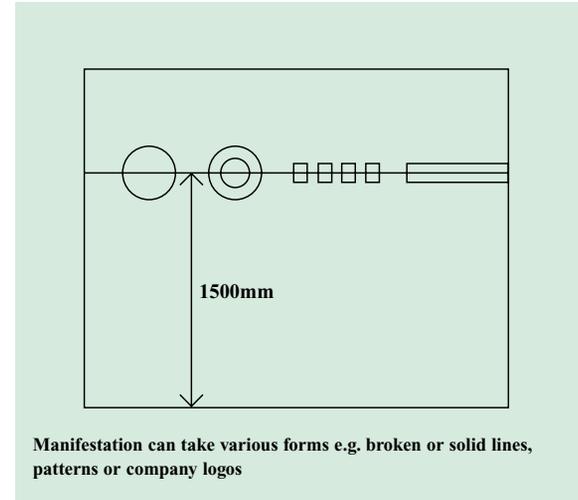
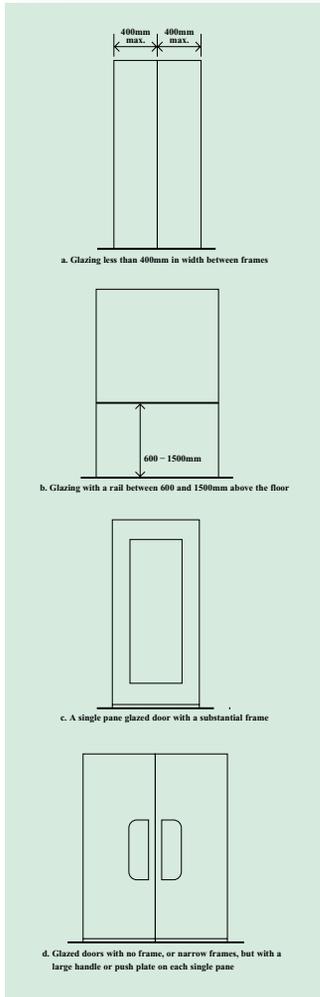


Figure 3. Height of 'manifestation' of large areas of transparent glazing

When manifestation is required it should be of a sufficient size to be immediately obvious and should be positioned between 600 and 1500mm above floor level and preferably be permanent and durable.



Note: An amendment to Part K of the Building Regulations, which came into effect in 1998, requires that swing doors should incorporate vision panels. See our leaflet on Regulations for Stairs, Ramps and Barriers for full details.

Figure 4. Examples of door height glazing not warranting 'manifestation'.

Scotland

Critical Locations

The November 1996 amendment to Part P of the Technical Standards Document is worded differently from England and Wales Approval Document N, but still requires that glazing in Critical Locations be specified in accordance with BS 6262: Part 4: 1994

Avoiding Collisions

It is a requirement that any door which swings both ways across a route of passage must be glazed or have a vision panel.

Cleaning of Windows

There are requirements to ensure that windows and rooflights can be accessed for safe cleaning, but there is no specific performance requirement for the glazing.

Northern Ireland

Technical Booklet V “Glazing” is almost identical in content to Parts N1 and N2 of the England and Wales Approved Document N.

General

There will be occurrences where, Pilkington Insulight is used in critical situations. If pedestrian access is from one side only, then only the glass on the access side needs to meet the requirements for safety. If access is possible on both sides of the installation then both of the glasses can be impacted, and they must both comply with the safety requirements already described.

It was mentioned at the beginning of this document that the Building Regulations relating to the regions of the UK were written at different times resulting in some difference in content and style of presentation.

It is the case that if BS 6262: 1994: Part 4 is used as the appropriate reference, the Building Regulation requirements of all three regions of the UK will be satisfied.

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