

A GUIDE TO

SAFE GLAZING

USING

SAFETY FILM

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SAFETY IN GLAZING REGULATIONS

You need to be aware of the following three Regulations/Standards:

1. REGULATION: **APPROVED DOCUMENT N of the Building Regulations 1991**
2. STANDARD: **BS 6262 Part 4 1994 “Safety in Glazing”**
3. REGULATION: **Workplace (Health, Safety & Welfare) Regulations 1992
REGULATION 14**

These are all essentially the same but relate to different end uses. But they **all** refer to **BS 6206** as the means by which a material is assessed as a **safety** material.

BS 6206

This is the means for devising safety materials for the various regulations concerned with safe breaking of glass. Briefly, the test is:

A punch bag filled with lead shot to give a gross weight of 100 lb is used to represent a child impacting a panel of glass. It is suspended on a suitable chain to impact the centre of a test panel.

Test panels of 1930mm x 865mm are used, in a vertical position.

The impactor, starting from 13mm off the test piece surface, is raised to the test height and released to allow one impact.

Four different panels are tested.

The above is repeated for filmed samples so that both sides (ie glass and film) are evaluated with a total of four panels each.

DROP HEIGHTS are:

305mm	to achieve Class C (the easiest)
457mm	to achieve Class B
1219mm	to achieve Class A (the hardest)

All panels must pass the defined criteria as shown above. The test to pass Class B includes the test to pass Class C and the test to pass Class A includes the tests to pass Class B and Class C.

BS EN 12600

The European equivalent to BS6206 is currently being phased in and will replace BS6206 in March 2006. This is **BS EN 12600**, which uses different test criteria.

The equivalent BS EN12600 standards are as follows:-

BS EN 12600 Class 3 suffixed A, B or C depending on impact test method used (equivalent to BS6206 Class C)

BS EN 12600 Class 2 suffixed A, B or C depending on impact test method used (equivalent to BS6206 Class B)

BS EN 12600 Class 1 suffixed A, B or C depending on impact test method used (equivalent to BS6206 Class A)

At present, BS EN 12600 has no requirement for glass to be marked to the appropriate pass standard achieved, although this is expected to change in May 2005. Until then, although our safety films have been tested and approved to BS EN 12600, we recommend that glass treated with our approved safety films be marked to the relevant BS6206 pass standard.

APPROVED DOCUMENT “N”

Approved Document N is one of an approved series that provides practical guidance on meeting the requirements of Schedule 1 and Regulation 7 of the Building Regulations.

Requirement **N1** gives guidance that all new buildings (or building work subject to the requirements of the Building Regulations) should have safety materials incorporated into the critical areas of glazing. For more information see

http://www.odpm.gov.uk/pub/904/ApprovedDocumentNGlazing1998edition_id1130904.pdf

Only part of a panel needs to fall into the critical areas for the whole panel to require protection.

Safe Break Defined as in BS 6206. No specific requirement for the BS 6206 Class is stated **but** Class A or B is recommended.

Robustness Thicker glasses may be used to impart strength and in certain situations may be considered safe.

Small Panes If the pane is < 250mm on smallest dimension, < 0.5sq.m in area and > 6mm thick, then it can be considered safe.

Screen Protection Permanent protection with a suitable screen (not allowing sphere of > 76mm to pass through) may be used. The glazing itself need not then be safety material.

Requirement **N2** gives guidance that suitable manifestation should be used on glass in critical locations which are different from N1.

Those areas where people may be unaware of the glazing and therefore may collide with it are **critical areas** for N2.

Where fixed means of manifestation exist (such as mullions, transoms, large frames, large push or pull handles) or glazing bars are less than 400mm apart, then no extra manifestation is needed.

A permanent manifestation method **must** otherwise be used, such as broken or solid lines, patterns or company logos to make the glazing apparent.

APPROVED DOCUMENT “M”

Approved Document M relates to access to and use of buildings and is currently being revised. The revisions include reference to manifestation in glazing which conflicts with the guidance contained in Document N.

Glass entrance doors and glazed screens will meet the requirements if:

1. There is manifestation in the glass at two levels, 850mm to 1000mm and 1400mm to 1600mm above the floor. The manifestation must contrast visually with the background seen through the glass, as seen from both directions, in all lighting conditions;
2. Manifestation takes the form of a logo or sign at least 150mm high (repeated if in a glazed screen), or a decorative feature such as broken lines or continuous bands, at least 50mm high;
3. Glazed entrance doors adjacent to, or part of, a glazed screen, are clearly differentiated from the screen by a high contrast strip at the top and both sides;
4. Glass entrance doors are protected by guarding, preventing the leading edge constituting a hazard when the door is held open.

Document M takes precedence over Document N whenever there appears to be a conflict.

BS 6262 PART 4 1994

The definitions are broadly the same as in Approved Document N; **critical locations** are those glazed areas most likely to be subject to accidental impact: **manifestation** is the technique for enhancing awareness of the presence of glazed areas: **safe break** is as in BS 6206.

Additional considerations:

Double glazed units

The pane or panes which have pedestrian access should all conform.

Doors and door side panels

Smallest dimension of pane >900mm, Class **B** minimum required.

Smallest dimension of pane >250mm and < 900mm, Class **C** minimum required.

Smallest dimension of pane < 250mm, area < 0.5 sq.m and thickness > 6mm, no Class required.

Door side panes the same as above if all or part is within 300mm of the door edge and all or part is within 1500mm of the floor.

Low level glazing

If all or part of the pane is within 800mm of the floor (and is not in or by a door) then Class C minimum is required unless:

Smallest dimension of pane < 250mm, area < 0.5 sq.m and thickness > 6mm, no Class required, or

Pane is part of building frontage (not a dwelling or dwelling house) then non safebreak glass may be used if it's thickness and dimensions fall within the limits in the following table.

Nominal thickness	Maximum allowable pane size*
8mm	1100mm x 1100mm
10mm	2250mm x 2250mm
12mm	3000mm x 4500mm
>15mm	no limits

*all four edges supported

Permanent screen

An independent robust screen may be used to reduce the risk of accidental impact.

Manifestation

BS 6262 Part 4 1994 requirement essentially identical to Approved Document N

Manifestation added to glazing should be permanent and between 600mm and 1500mm off floor level.

Applied materials should be durable and not easily removed.

WORKPLACE (HEALTH,SAFETY & WELFARE) REGULATIONS 1992

A significant extension to Approved Document N is that these regulations require all **new** workplaces to comply **immediately** and all **existing** workplaces to comply from **1st January 1996 (SEE REGULATION 14)**

Interpretation

Essentially the same as Approved Document N and BS 6262 Part 4, therefore these documents can be used for guidance.

Critical Locations

Up to waist height for low level glazing (typically 1100mm)

Up to shoulder height in or next to doors (typically 1500mm)

Only part or all of the pane need to fall within these areas for the whole pane to require protection.

Risk Reduction

Every glazing panel shall, where necessary for reasons of health or safety (ie panels falling within the critical areas) :

Either be of safety material, such as safe break to BS 6206 or be protected against breakage, such as a screen or barrier

Be marked to make it apparent to reduce the risk of accidental collision (manifestation)

SAFETY GLASS

There are three glass types that satisfy the safe break requirements of BS 6206:

Toughened Glass must disintegrate into dice with the ten largest crack free particles remaining three minutes after the impact to weigh no more than the mass equivalent to 6500 sq mm of the original material. The mark on the glass will be similar to BS 6206 AT.

Laminated Glass can break into separate pieces but none of these to have sharp edges which are pointed or dagger like. Pieces retained by the interlayer are not considered separate. There must be no shear or opening through which a 76mm sphere can pass freely. The mark on the glass will be similar to BS 6206 BL.

Filmed Glass can break into separate pieces but none of these to have sharp edges which are pointed or dagger like. Pieces are retained by the surface film. There must be no shear or opening through which a 76mm sphere can pass freely. The mark on the glass will be similar to BS 6206 AF.

BS 6206 and EN12600

GUARDIAN Glazing Films have been successfully tested to meet the requirements of the BS 6206 and EN12600 classes shown:

100 micron (4 thou)	1 ply	BS 6206 CLASS C & B	EN12600 CLASS 2
175 micron (7 thou)	1 ply	BS 6206 CLASS C, B & A	EN12600 CLASS 1
200 micron (8 thou)	2 ply	BS 6206 CLASS C, B & A	EN12600 CLASS 1
250 micron (10 thou)	3 ply	BS 6206 CLASS C, B & A	EN12600 CLASS 1
350 micron (14 thou)	3 ply	BS 6206 CLASS C, B & A	EN12600 CLASS 1

RISK ASSESSMENTS

Employers have a specific responsibility to carry out risk assessments. For Regulation 14, a Risk Assessment is essential.

The Risk Assessment should be written where there are 5 or more employees.

Where the risks are considered to require remedial action - “where necessary for reasons of health and safety “ - an action plan should be formulated and implemented in reasonable time to reduce these risks.

SAFETY FILM AND THE REGULATIONS

In specifying and utilising safety film to comply with the various regulations and standards, it is vital to carry out fully indemnified, accurate and thorough Risk Assessment Surveys, giving careful consideration to the type of film to be used and to the quality of the installation.

GUARDIAN provide a **complete, professional** service for you. From initial survey, specification and installation through to fully indemnified peel adhesion strength tests to ensure that our product or service continues to perform to the highest standard.

PEEL ADHESION STRENGTH TESTS

If you have an existing film installation, we can carry out a fully indemnified peel adhesion strength test to determine that it is still fit for purpose.

MARKING OF GLASS

Unmarked glass **cannot** be assumed to be safe even if it is identified as laminated or toughened (heat strengthened)

Glazing already installed **cannot** be marked as per BS 6206 since it cannot be assumed to be a safety material