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Glass and Glazing Federation

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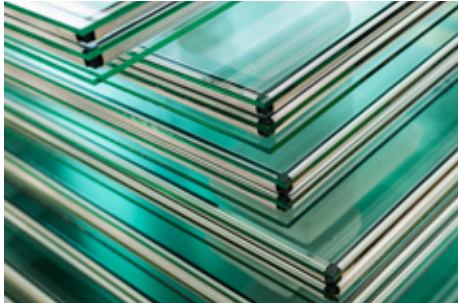
Laminated Glass Safety and Security

Can you afford not to use it?



What is Laminated Glass?

Laminated glass is two or more sheets of annealed or heat treated glass bonded together using interlayers. Laminated safety glass can be classified in accordance with EN 12600:2002.



Laminated glass

Safety and Security through strength

Its most significant feature is that if the glass fractures on impact, the fragments will remain bonded to the interlayer, minimising the risk of injury from flying glass, and maintaining the protective barrier.



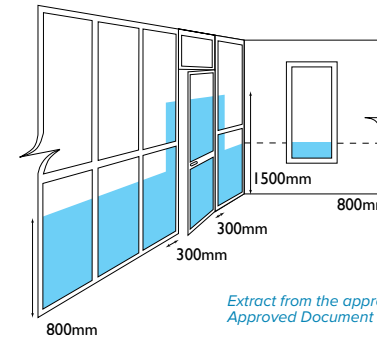
Broken annealed laminated glass

Common Types

The customer's requirements in respect of the strength of laminated glass can be met by varying the quantity, thickness and nature of its layers to create:

- **Laminated Safety Glass**
Laminated safety glass is a recognised safety glazing material as defined in EN ISO 12543 part 2. It is therefore suitable for use in the shaded areas shown in the diagram which require safety glazing by law under Building Regulations.
- **Laminated security glass – manual attack resistant glazing**
Laminated security glass can withstand repeated manual blows, providing adequate protection until the pane can be replaced. This type of laminated security glazing is manufactured for classification in accordance with EN 356. Correct framing and installation is essential to achieve the required level of protection.
- **Laminated security glass – bullet resistant glazing**
This type produces an effective barrier between an armed aggressor and the persons under threat. The glass specification will depend on the perceived level of threat as set out in EN 1063. Correct framing and installation is essential to achieve the required level of protection.
- **Laminated security glass – explosion resistant glazing**
This type of laminated security glass can mitigate the effects of explosions. Correct framing and installation is essential to achieve the required level of protection.
- **Acoustic**
Enhanced sound reduction can be achieved by using laminated glass.
- **Solar**
Solar energy can be controlled by introducing tinted or coated glasses or interlayers.

Mandatory Safety Glazing areas



The above diagram shows the critical areas where safety glazing materials, e.g. Laminated Safety Glass, must be used in new and replacement glazing applications in all buildings.

Special Laminates

Laminated glass when incorporating special components can provide a wide range of additional benefits. Laminated Glass can be incorporated in to Insulated Glass Units (IGUs)

- Laminated double glazing – greater thermal and acoustic insulation.
- Laminated heat treated glass – greater protection from mechanical and thermal stresses.
- Laminated coated glazing – greater energy efficiency and protection against sunlight.
- Laminated fire resistant glass – creates a barrier against fire.
- Laminated mirror glazing.
- Laminated decorative glazing.
- Laminated glass and electronics – heated glass, alarm glass, photo-voltaics.
- Curved Laminated.
- Floors and Stairs.

Availability

Laminated safety glass and some laminated security glasses are available from stock and can be cut to size without delay.

Marking

Laminated Safety Glass used in critical locations must be permanently marked to show compliance with BS 6262-4 and the appropriate Building Regulations.

The Glass Marking has to be visible after installation. The following is a representation.



The marking should show three pieces of information.

- Name or Trade mark of manufacturer
- Number of the European Standard e.g EN 14449
- Impact classification result to EN 12600 e.g. 2B2

References

The following standards refer to Laminated Glass:

- BS 857:1967 Specification for safety glazing for land transport.
- BS 6180:1999 Code of practice for protective barriers in and about buildings.
- BS 6262-4:2005 Code of practice for glazing in buildings.
- BS EN 12600:2002 Glass in Building- Pendulum test, impact test for flat glass and performance requirements.
- BS EN 14449: Glass in Building – Laminated and laminated safety glass – product standard.
- BS ISO 11485-3 2014 Glass in Building – Curved glass requirements for curved tempered and curved laminated safety glass.
- BS EN ISO 12543: Part 2. Glass in Building – Laminated and laminated safety glass - Part 2: Laminated safety glass.
- UN Regulation R43-1981

The 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.

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The GGF logo on a company's literature or vehicles is a sign of quality and reliability. Insist on a GGF Member.

Further Information

More information on laminated glass can be found in the following GGF publications:

- The Right Glazing in the Right Place
- GGF Data Sheet 4.10 – Products, Appearance and Visual Quality Specification for Insulating Glass Units
- GGF Data Sheet 4.11 Laminated Glass and Laminated Safety Glass
- GGF Data Sheet 4.12.1 – Curved Glass Part 1: Generalities - Definitions, Terminology, Properties and Basis of Measurement and Test
- GGF Data Sheet 4.12.3 – Curved Glass Part 3: Curved Thermally Treated Glasses
- GGF Data Sheet 6.3 – Security of Window and Door Products
- GGF Data Sheet 7.1 – Non-Vertical Overhead Glazing: Guide to the Selection of Glass from the Point of View of Safety
- GGF Data Sheet 7.2 – Guidelines for the Use of Glass in Protective Barriers
- GGF Data Sheet 7.3 – Guidelines for the Use of Glass in Floors and Stairs
- GGF Data Sheet 8.1.1 – Security Glazing – Part 1: Definitions and Descriptions
- GGF Data Sheet 8.1.2 – Security Glazing – Part 2: Manual Attack Resistant Glazing
- GGF Data Sheet 8.1.3 – Security Glazing – Part 3: Bullet Resistant Glazing
- GGF Data Sheet 8.1.4 – Security Glazing – Part 4: Explosion Resistant Glazing
- GGF Data Sheet 8.1.5 – Security Glazing – Part 5: Framing and Installation
- GGF Safety and Security Good Practice Guide

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