High Strength Monolithic Fire Resistant Glass

High Strength Monolithic Fire Resistant Glass, a new type of fire resistant glazing, is fabricated with ordinary float glass specially treated with thermal and chemical methods, which can be used in anywhere for curtain walls, doors and windows, partitions, when there is a fire resistant requirement.

FEATURES
1 Fire resistant performance

Modern building has recently enabled various glass, such as float glass, tempered glass, laminated glass, insulated glass, coated glass etc., to be used as glass facades. Although such glass features differently, none of them has fire-resistance performance. Where there is a fire, it will spread easily through broken glass to neighbors in a very short period of time, threatening human lives and causing property losses.

When fire occurs outdoors, high strength monolithic fire resistant glass can effectively prevent the invasion of flames and smokes, thus providing the security of human lives and properties.

The unique high strength monolithic fire resistant glass has been produced with both physical and chemical approaches by our company, it is a kind of architectural glass with fire resistance properties.

The glass can retain integrity for about 84-183 minutes even cauterized by the flame with 1000 °C high temperature. The unique fire resistant properties can effectively prevent the spread out of flames and smokes; enable people to have enough time to evacuate from the scene and take immediate actions to put out the fire.

With the application of high strength monolithic fire resistant glass in facades, the demerit of poor fire resistant properties which limits its use as structure materials in buildings is overcome, and therefore safety factors are greatly improved.

FRG was satisfy the criterion of BS476 Part 22:1987

Fire Resistant Testing
High Strength Monolithic Fire Resistant Glass

APPLICATION TIPS

1. When moving wooden boxes, please handle with care; watch the “Arrow” markings affixed to the boxes. Wooden boxes shall be stored in a dry warehouse. A cushion is recommended to be placed under the box.

2. When opening boxes, impact of toolings with glasses shall be avoided to prevent any damage, scratches or other defects affecting applicability.

3. During handling, installation, contact with hard materials shall be avoided to prevent any damage or scratch which adversely affect applicability. Handling is recommended to move vertically and to use vacuum cups as possible.

4. Protection film on glass shall be removed after installation. For vacuum cup handling, only remove the part of film where vacuum cups are applied.

5. During installation, tin foil around the edge of glass shall be removed, using single sided blade. Generally, it is recommended to remove tin foil after glass is secured. For reasons of protection of glass edge, it is also recommended to maintain the foil as much as possible.

6. After opening boxes, glass shall be stacked on the “A” shape rack, 6-10° from the vertical. Long side of glass shall be in contact with supporting surface. Glass bottom edges shall be placed with a soft cushion, like cork wood. Between glasses, a paper or polystyrene film shall be placed to prevent from scratches. Measures shall be taken to prevent from rain or moisture.

7. Protection gloves and safety glasses must be put on during work.

TECHNICAL STANDARDS

- BS476 Part 22:1987 Fire tests on building materials and structures

This special new born has been paid close attention by national construction departments, fire control departments and technical and science departments. In order to let it widely used in modern buildings, some national standards and industry standards and codes are modified like:

“Safety glazing materials in building fire-resistant glass GB15763.1-2001”

“Technical specification for building glass application JG J113-2003”

“Technical code for glass curtain wall engineering JG J102-2003”

“Code for Fire Protection Design of High-rise Buildings GB50045-95”

The high strength monolithic fire resistant glass has been awarded as:

“National Significant New Product” in 2001 by five National Departments like Ministry of Science and Technology (MOST) and so on; listed into “2002 National Torch Programme” by MOST and 

“2002 National Science and Technology Achievements Spreading Programme” by Ministry of Construction.
4 High weatherability

The fire resistant glass does not change its appearance under UV radiation and its chemical stability is excellent. Its workability enables it to be further processed into laminated safety glass, energy saving insulated glass, Low-E glass etc. Hence it can be extensively used as glass facades, roofs, indoor partitions, fire doors and fire escapes. The sunlight, spaces and scenes through this glass in modern buildings can be enjoyed safely.

5 Adaptability to state new regulation

Ordinary glass curtain walls do not have the resistance to the fire, therefore the whole building system becomes vulnerable when there is a fire breaking out. In order to prevent the fire from coming out of the opening caused by broken glass and propagating into adjacent areas, threatening the security of human life and property, newly revised Fire Resistance Code of Design of High Rise Buildings and Glass Curtain Wall Technical Engineering Code specify that some part of the external enclosure for high rise buildings must have fire resistance. With many year effort, our company has successfully developed a light weight, thin, super tough, excellent anti-weather monolithic FRG, which meets the requirement of national new codes, thus solving the problems of fire resistance for external glass walls. Such products have been now widely used in many city buildings as their landmarks.
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- **EXAMPLES:** GLASS PANEL SIZE 1500X2000MM WITH THICKNESS OF 10MM, FOUR SIDE SUPPORTED, THE CALCULATION RESULTS ARE AS FOLLOWS:

  - Allowable wind load $W=3.9\,\text{kN/m}^2$
  - Monolithic FRG

  - $W=2.6\,\text{kN/m}^2$
  - Tempered glass

  - $W=0.87\,\text{kN/m}^2$
  - Float glass

3 Workability
FEATURES

2 High strength

High strength monolithic fire resistant glass has not only the excellent fire resistant properties but also the super high strength. With the same thickness, it is 6-12 times stronger than the float glass, more than 1.5 times stronger than the tempered glass. Under the condition of same wind pressure, such fire resistant glass can provide the structure designer thinner glass or wider selection, improve the transparency and reduce the construction cost. It can be fabricated as the floor glass capable of supporting 40-ton (392000 KN) pressures and the bullet resistant glass supporting the impact waves from 1000 pounds dynamites bombing 50 feet away.

The fire resistant glass has complied with the requirements specified in the standards of BS476, ASTM, UL and US General Services Administration (GSA) Standard Test Method for Glazing and Glazing Systems Subject to Air Blast Landings, ASTM 1642-2004.
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TRADITIONAL GLASS EXTERIOR WALL IN CASE OF FIRE EXPOSURE

- Crack occurs less than 1 minute with float glass, 5 minutes with tempered glass
- Spread-out of fire through openings caused by broken glasses
- Indoor property caught with fire coming through broken glasses

HIGH STRENGTH MONOLITHIC FIRE RESISTANT GLASS IN CASE OF FIRE EXPOSURE

- In case of indoor fire:
  Remain unbroken at a temperature of 1000 Celsius within 84-183 minutes, effectively retarding the spread out of fire and smoke
- In case of outdoor fire:
  Effectively prevent the flame and smoke from entering into the indoor, thus ensuring the security of human life and property.