Fire Protection System Glass from Asahi India Glass

Glass is an integral part of modern architecture and interior design. A versatile and sustainable material, glass – used for facades, windows or in interiors – gives buildings and homes structural stability, aesthetic appeal and a contemporary look, while helping use new energy and cost.

There has been some debate about safety in the use of glass in general, and in the case of fire in particular. Glass façades have been held responsible for aggravating fire accidents and their consequences in buildings. However, nothing could be further from the truth. When proper norms are being followed, both glass and glass structures are fire-resistant, and the different types of glasses are used for façades, the destructive effects of fire are greatly reduced.

Fire Safety – An all-round affair

The right knowledge and a broader perspective can help us make the correct judgement of the role of glass in case of fire. In this regard, let us understand some related aspects and issues.

Anatomy and physiology of a building

Fire, initially, are explosive, destructive events that determine a building's susceptibility to fire. These include the type and size of the building. Its construction methods, the number and type of occupants, the fire alarm and fire alarm systems, the type and density of occupancy, the building's age and the fire prevention and safety arrangements.

Fire safety engineering

In international building design, fire safety engineering plays a very important role. It uses scientific principles to understand fire and human behaviour in fire incidents, thereby helping in safeguarding people, property and the environment from destruction. It involves the following aspects:

- Alfred analysis of fire hazards and their impact areas.
- Effective building design and construction.
- Determining optimum fire prevention and safety measures.
- Design, installation and maintenance of fire-detection systems.
- Appropriate equipment and manpower for fire-fighting and rescue operations.

Fire protection systems

Fire and smoke protection systems should be adopted while designing buildings. Passive fire protection (PFP) is an important part of the fire safety strategy of any building. These work by creating a barrier, limiting spread of fire, smoke, and热量, protecting unprotected components and structural systems. Examples of PFP include fire doors, fire-resistant glass walls/bars/floors/ceilings, fire-resistant sprayed coatings on structural steel, smoke barriers, smoke control systems, fire-stopping penetration seals, etc. These do not provide a complete solution but are intended to work in conjunction with active fire preventive systems like fire alarms, smoke detection, sprinkler systems, extinguishing and escaping systems like fire exits, fire lifts, refuge balcoes, etc.

There should be openings for doors, windows, structural and HVAC penetrations. A window-like opening should be provided on each floor of the building.

Glass – See what’s safe

Internationally today, there are excellent alternatives available for clear vision safety glasses. These include high-performance, soft-metallised glasses with interlayer laminates, special finishes and laminates. These have also proved very popular for architectural applications where they are manufactured in a variety of colors to suit specific architectural designs. The safety and comfort characteristics of these glasses also make them ideal for use in commercial buildings and office buildings and provide clear vision free-of-charge. These offer undeniably safer, softer, more comfortable, more visually appealing and more aesthetically-pleasing environments than traditional glass.

In fact, today, there are products that can actually substitute a brick wall in terms of fire-resistant properties, yet far more attractive and softer. While some brands do increase safety functionality by offering a physical barrier preventing spread of fire and smoke, certain advanced solutions can actually drastically reduce the radiant heat from a fire.

The European classification standards (EN 13501) for glass use the following system:

- F – Integrity
- W – Low radiation

1. Insulation

Accordingly, the following types of glasses are available in the FRG range:

- E Class – They provide for only integrity. These are special tempered glasses and they prevent the spread of flames to the non-fire side. They will be no protection from radiation in this type of glasses. They are normally used for internal applications.

- FW Class – These are tempered and laminated glasses. They prevent the flames and also control the radiation on the side exposed to a maximum of 1.5 W per sqm. They offer integrity and provide for low heat radiation. They are used for internal and external applications.

- E Class – These type of glasses offer integrity and insulation. The maximum temperature on the non-fire side is limited to 140°C in average for 60 minutes (Classical) or 110°C (Fast). Specialised glass is one of the ways to protect from fire and fire hazards. A range of high quality, fire-resistant glasses are available today to mitigate the adverse effects of fire accidents and offer enhanced protection.

- Wood-glass – It is more stable at higher temperatures and is also resistant to the pressure of fire hoes as the embedded wire mesh helps the glass keep its structural integrity even after thermal stress causes cracks. This property makes wood glass ideal for preventing fire ingress.

- Borosilicate glass – Famous its use in the manufacture of cooking vessels, Borosilicate, because of its extremely low thermal expansion coefficient, is ideal for any application that requires heat resistance.

- Toughened glass – The special tempering process used in this glass makes it highly resistant to stresses. Additionally, even when it gets to the point of breaking, finely granulated glass is broken into small granules that are very less likely to cause any injuries.

- Toughened glass with flame retardant coating – This flame retardant coating is typically metal that further enhances the flame and heat resistance of the glass.

- Toughened glass with intumescent gel – As is the property of any intumescent, the gel increases greatly in size when exposed to fire, and its high hydration content keeps the surrounding areas significantly cooler than the glass material. This kind of glass is highly efficient in locations within buildings with high concentration of people.

- Laminated glass with interlayer materials – Highly desirable for facades, the laminated makes it hardy enough for extreme conditions. Another property of this glass ensures more time for residents to evacuate the area before the fire reaches the maximum temperature.

Conclusion

It would be unfair to blame glass for the destruction caused by fire in buildings. In most cases, it is negligence kind or illegal poor-quality design and construction that result in loss of life and property. If proper norms and building safety codes are followed, and guidelines adhered to, glass façades only help in fire rescue and not make it worse. All over the world, glass is a widely accepted building material utilised on a massive scale for architecture and design.