Fireproof glass types and classification

Fireproof glass is now widely used in the construction and household industries. Such as: architectural windows and doors, partition walls, skylights, smoke blocking wall, perspective floor, exterior walls, outdoor, windows, fire-proof glass frameless door; building patio, atrium, etc. Compared with traditional architectural glass, fireproof glass (or fire rated glass) is relatively new, some glass processors are not really understand the fireproof glass very well, fire-rated glass manufacturers usually named their fire resistant glass with unique code and don’t leak detailed glass configuration to clients. This complexity of fire glass products can confuse the unsuspecting specifier, builder contractor and installer, sometimes leading to incorrectly installed applications, which is a subject matter in its own right.

Here we introduce some professional fireproof glass knowledge to help architect and designers know more about the fire rated glass.

The fire proof glass can be divided into: Toughened/tempered fireproof glass, laminated fireproof glass, and composite fireproof glass.

1. Tempered fireproof glass/fire resistant glass/fire-rated glass
A. Borosilicate monolithic glass.

Its fire resistance is derived from its very low coefficient of thermal expansion – only 4 x 10^-6 (20-300°C), which is 2 to 3 times lower than normal glass (silicate glass). In addition, borosilicate monolithic fire-resistant glass also has a high softening point, excellent thermal shock resistance and viscosity. Therefore, when a fire occurs, the borosilicate monolithic fireproof glass is not easy to expand and crack, and is a high-stability single-piece fireproof glass with a fire resistance time of up to 3 hours.

B. Monolithic potassium cesium fire-resistant glass

It is a special chemical treatment for more than 20 hours of ion exchange at high temperature, replacing the metal sodium on the glass surface to form a low-expansion silicate glass with a coefficient of expansion of 1.8*10^-6/°F (3.24*10^-6/°K), so it has high heat resistance, and at the same time, through tempering process, the surface of the glass forms high compress stress, which greatly improves the impact strength. When the glass breaks, it shows a state of tiny particles, reducing damage to the human body. The strength of potassium cesium fire-resistant glass is 6-12 times that of clear glass and 1.5-3 times that of tempered glass.

C. Wired glass.

It is made by heating a common clear glass to softening state, and then pressing a preheated iron wire or a wire mesh into the middle of the glass. Its characteristic is superior fire resistance, can block the flame, does not burst when burning at high temperature, and will not cause debris to hurt when broken. There is also anti-theft performance.

2. Laminated fireproof glass/fire resistant glass/fire-rated glass
A. PVB laminated glass.
It’s made with single piece glass mentioned above and PVB interlayer. Some fireproof glass application require both safety and fireproof function. The PVB laminated fireproof glass has same advantages as laminated glass, e.g., UV resistance, high strength, thermal and acoustic insulation.
If laminating 2 piece fireproof glass, the glass will have double side fire resistant performance.

B. Fireproof interlayer laminated glass.
Different from PVB laminated glass, this kind of glass include one layer or multi layer special fireproof interlayer, the interlayer thickness is usually 2mm.
When a fire occurs, the interlayer will burst quickly after encountering high temperature to the fire surface glass. The fireproof interlayer will expand about ten times and form a white opaque fireproof rubber sheet. Fire integrity is ensured.

3. Insulated fireproof glass

It consists of two pcs glass (three or more layers maybe required if fire resistant requirement is high), and is sealed with special flame retardant strips. The fireproof glue in the middle is solidified and bonded to the glass in a transparent form.
Fire prevention principle: After high temperature, the transparent fireproof rubber layer in the middle of the glass will quickly harden and form an opaque fireproof insulation board. While preventing the spread of the flame, it also prevents the high temperature from being transmitted to the back surface. This kind of fireproof glass not only has fireproof and heat insulation properties, but also has excellent sound insulation effect.
According to the fire resistance time, there’re 30mins, 60mins, 90mins, 120min, 180mins fireproof glass.

The standards for fire resistant proof are:
UL 10B
Standard for Fire Tests of Door Assemblies
UL 10C
Standard for Positive Pressure Fire Tests of Door Assemblies
UL 9
Standard for Fire Tests of Window Assemblies
BS476 Fire test to building materials

Before selecting fireproof glass, it is necessary to know the specific requirements of fireproof glass. It is different characteristics such as fireproof, heat insulation or smoke insulation, fire resistance limit. Then choose the model that suits you.

Morn is your turnkey fireproof glass supplier, welcome contact us for more info.

Tags: Borosilicate monolithic glass, BS476 Fire resistant glass, fire resistant glass, Fireproof glass, fireproof glass classification, fireproof glass knowledge, fireproof glass supplier, firerated glass manufacturers, Insulated fireproof glass, Laminated fireproof glass, potassium cesium fire-resistant glass, pvb laminated glass, UL9 fireproof glass, wired glass
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Other facade materials: Aluminium alloy profiles, aluminium plates, aluminium windows & doors, Assa Abloy hardware, spider fitting, railing systems, shower rooms, polyurethane panels, machines & tools, steel structure, are also available since 2019. From aesthetics, to strict environmental and energy specifications, to critical budget and delivery requirements, our input can make a difference.

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