

Heat Soak Test

Heat Soak - the terminator of "Spontaneous Self Breakage" of tempered glass.

In certain occasions, only tempered glass or its composite could meet the quest of total thickness and air-pressure for the curtain wall of building. But it also brings the threat, spontaneous self breakage, when it is set in high buildings. But fortunately, we can greatly reduce the risk of breakage through "Heat Soak". It is the favor of advanced technology.

There are two causes of spontaneous breakage: one is the natural matter, and another one is the acquired matter. The natural matter is caused by the existence of air bubble or other impurity, include nickel sulfide. The acquired matter is caused by the incomplete of corners and edges or the improper installation due to negligence of process before tempered. Strict quality control can solve problems of air bubbles, particle size of impurity, and incomplete of corners and edges. The quality of construction is also able to control the spontaneous self breakage. But only nickel sulfide is not viewable by human eyes and hardly examined by normal device and equipment as well. In this case, it can only expect and depending on lucky that the spontaneous self breakage not happed after tempered and installed.



The reason of the nickel sulfide can cause spontaneous self breakage is that there are two types of nickel sulfide molecules, α and β . The structure of molecules is varied depending on the ascending and descending temperature. It is also the cause of spontaneous self breakage. But why the glass produced from the Lehr without this problem? It is because of its slowly cooling process, it allows nickel sulfide having sufficient time to transform from α to β . However, nickel sulfide transform from β to α in the tempering process while glass is gradually heated up over 380°C . But the time is not sufficient for nickel sulfide to return to steady status β in the process of rapidly frozen. Then the structure of nickel sulfide is "freeze" as the status of unstable molecule " α " inside the tempered glass. Unstable " α " will seek the chance to transform to " β " finally. If this transformation is happening in the center zone of compressive stress, the balance of stresses will be broken and cause spontaneous self breakage.

Heat Soak is indeed an ideal environment to prompt the transformation of unstable type of nickel sulfide inside the furnace. All possibilities of future spontaneous self breakage will be detonated in the furnace in advance. So Heat Soak can be only considered as the screening process.

According to the regulation of DIN 18516 of Germany, the process of Heat Soak test slowly heats the tempered glass to 290°C in 2 hours, and then keeps the temperature at 290°C±10°C for 8 hours. Afterward, reducing its temperature to the normal atmospheric temperature in 2 hours. This way can prompt over 99% of transformation of nickel sulfide. In other word, by this refinement, most possibilities of future spontaneous self breakage after installation from the problem glass with incomplete of corners and edges, air bubbles, and other impurity would be detonated in advance through the process of transformation inside the furnace.

The temperature of Heat Soak is set at 290°C. It is because of the strength of tempered glass may reduce as the temperature over 300°C. This status is what people called "Strength Recession". Therefore, the temperature must be strictly controlled in the overall manufacture process, especially when the temperature is ascending.

Tempered Glass can be identified by "Polarizer" and "Strain Gauge". But there is no any device or method to identify if the glass is made through Heat Soak or not. Some bad companies are often to supply the glass without Heat Soak, but faked the buyer that this glass is processed by Heat Soak. The only guaranteed way to get real Heat Soak Processed Glass is cooperating with reliable supplier who is manufacturing with the qualified Heat Soak Furnace.

Characteristics

1. **Advance machine equipment:** STANLEY GLASS had imported the most famous automatic computerizing control system Heat Soak furnace around the world.
2. **Standard manufacture process:** The tempered glass is slowly heated up to 290°C with proper time, and then keep it at temperature of 290°C±10°C for 8 hours. (DIN standard of Germany). Afterward, reducing its temperature to the normal atmospheric temperature with proper time.
3. **Strictly control temperature:** In the process of Heat Soak, the result of "Strength Recession" is easy to happen. The toughness will be serious reduced especially when the temperature over 300°C. Therefore, the temperature must be strictly controlled in the overall manufacture process, especially when the temperature is ascending.
4. **To assure the strength of glass:** In addition to the attention on the process of tempered manufacture, the qualified Heat Soak furnace shall be used in the manufacture process as well. So the qualified Heat Soak Processed Glass can be ensured to produce.

Applications

- Tempered Glass : Applies to every tempered glass.



Stanley gives glass a whole new life



Specification

Thickness(mm) Max Size(mm × mm) Min Size(mm × mm)

3 ~ 19 2700 × 6000 Unlimited

* If you have any other special size requirements, please [contact us](#).