

AGG TECHNICAL BULLETIN – HEAT SOAKING

The Australian Glass Group recommends heat soaking all toughened glass when the glass is to be glazed in structural applications, or when safety is paramount, such as balustrades, pool fences and overhead glazing.

What is heat soaking?

The heat soak test was developed to detect the presence of nickel sulphide inclusions in toughened glass. Nickel Sulphide inclusions are formed when nickel and sulphur contaminants find their way into the glass batch. The nickel and sulphur combine during the manufacturing process to form “stones” in the body of the glass. These “stones” are often very small and not able to be seen. Whilst the glass remains in its annealed state these nickel sulphide inclusions do not cause any problems because the transformation occurs as the glass is slowly cooled during manufacture. However when the glass is rapidly cooled as part of the toughening process, the nickel sulphide remains trapped in its high temperature form until some years later when its transformation leads to breakage of the glass ie. Spontaneous breakage. These breakages may not occur immediately, and it may take several years (solar heat cycles) for any problems to become apparent.

The heat soak test is based on reheating the toughened glass to an elevated temperature that accelerates the expansion in the nickel sulphide inclusions. This increases the probability that, if inclusions exist in the glass, the glass will break in the heat soak test rather than insitu. The heat soak process reduces the risk of the spontaneous breakage due to Nickel Sulphide inclusions but it does not guarantee the elimination of Nickel Sulphide impurities.

Note that heat *soaking* is not the same as heat *strengthening*. Heat strengthening is performed in the toughening furnace by heating the glass to the same temperature as normal, but cooling it down more slowly. This results in less “tough” glass with larger fragmentation particle size. This is useful for some specific applications and may be recommended by an engineer. This does reduce the incidence of NiS spontaneous failure, but not as much as heat soaking.

What do I need to know?

Any project completed after May 1 2011 may be affected. This may mean glass ordered any time after Christmas 2010 may be affected.

The Building Code of Australia (BCA) made this voluntary from May 1 2010 and compulsory from May 1 2011.

It will apply to:

- all buildings except for single residential dwellings. This means commercial, offices, factories, unit blocks, nursing homes, schools etc
- all vertical glazing over 5m off the ground

Can I avoid it?

Unfortunately not! The BCA has given you options for making the external glass safe from spontaneous Nickel Sulfide failure. You can use:

1. annealed glass, or
2. heat strengthened glass, or
3. laminated glass, or
4. toughened glass that has been heat soak tested

What impact will this have on me?

This may have a very significant impact on your business.

Lead time – the process of heat soaking will add up to 2 days additional to your lead time

Rebatches – again, these will take longer than previous

Cost – we will be charging extra. Industry standard at present is to charge by the sqm, with rates increasing for thicker glass to reflect the costs of handling and breakage.

How do I know if my glass has been heat soaked?

Unfortunately there is no way for you to tell by looking at the glass and no test you can do. You need to rely on the quality of your glass supplier.

Beware of imported glass that may or may not be heat soaked.

There is also “good” heat soaking and “bad” heat soaking. Only suppliers that can guarantee that they meet EN14179-1:2005 and provide records from EVERY heat soak batch can be trusted.

We will put a sticker on your heat soaked glass and provide records on request.

How can AGG help?

We have acted ahead of time and installed heat soak furnaces in our factories. We think that it will impossible to meet your service requirements without such a facility. Our heat soaks meet the requirements of EN14179-1:2005

Should you have any further queries, please don't hesitate in contacting your local AGG representative.