

Tempering & Heat Treatment

Tempering is the process of heating the glass to near melting temperatures and rapidly “quenching” it with cool air in order to mechanically stress the glass and create a strong, resilient “skin” that is anywhere from x2 to x4 times stronger to that of the original annealed glass. Tempering is required when safety or durability is required on oversized glass lites.





Specification

Glass Thickness

Metric Measurement

5mm to 12mm

Imperial Measurement

3/16" to 1/2"

Coated Glass

5mm to 10mm

3/16" to 3/8"

Minimum Dimension

400mm diagonal

16" diagonal

Maximum Dimension

7000mm x 3300mm

275" x 130"

The Difference Between the Two

One of the benefits of AGNORA's heat treatment process is our ability to perform two types of procedures, allowing specifiers to work with laminates, glass thickness and optical distortion/anisotropy characteristics to yield the best balance of strength, clarity and durability.

HEAT STRENGTHENED

- x2 strength of annealed glass
- breaks in large islands
- is effective at reducing break-ins when paired with an interlayer. The large islands allow the interlayer to continue to support the architectural glass lite

FULLY TEMPERED

- x4 strength of annealed glass
- breaks in small pebbles and is very safe for the public
- should be used when a stronger structural glass is called for and with a laminate to provide SOME theft protection

One of the largest tempering ovens in the world.

AGNORA's state-of-the-art tempering line is unique in its ability to treat glass up to 130" x 300" and 1/2" thick; the largest glass available in North America. With this sort of size, a crystal clear, uninterrupted view is achievable paired with impeccable strength.

Scanning for Optical Distortion

The use of the LiteSentry in-line scanner allows AGNORA to assess the overall optical quality of each piece of glass passing through the tempering oven. The system performs this measurement through hundreds of small cameras to a millidiopter. For context, this measurement is 250x more exact than the average prescription glasses. This level of detail shows variation in glass thickness and surface flatness, both of which contribute to distortion.

This level of detail is the essence of quality at AGNORA – investing in equipment, people and technology in an effort to produce the perfectly balanced tempered glass with strength, clarity and anisotropy.

Food For Thought – Annealed vs. Heat Treated

Traditionally, if a strong window is desired, the popular opinion is to heat-treat glass to mechanically strengthen it. While heat-treating glass will indeed strengthen the material, you may be putting a building at risk of a break-in.

Why? The improvements in structural interlayers such as Kuraray's SentryGlas substantially increases the structural power of architectural glass. The important distinction is that as glass becomes less rigid, the interlayer cannot maintain the glass's structure. In other words, a broken lite of annealed glass married to SentryGlas will maintain its form as opposed to a fully-tempered lite which breaks into small pebbles and can soften and fail.

Fully tempered monolithic is a safety glass but it does not stop burglars to do a quick break & grab. Only laminated glass can give you peace of mind.

Find out more in this in-depth analysis by Louis Moreau, Head of Innovation

