



Annealed vs. Tempered Laminated Glass

As per the National Standards Canada – Safety Glazing CAN/CGSB 12.1-2017 (supersedes 12.1-M90):

Scope

[The] National Standard of Canada applies to glazing materials that have been subjected to the test methods described [in the standard]. Such test methods are intended to demonstrate minimum performance characteristics designed to reduce the likelihood of cutting and piercing injuries resulting when glazing materials used in areas of human impact...in building and Architectural applications are broken by human impact.

The standard does not address the strength, durability, fire-rated characteristics, appearance, or methods of installation for glazing materials.

The following are not considered safety-glazing materials under the standard: monolithic annealed glass, monolithic heat-strengthened glass, monolithic chemically strengthened glass, monolithic glass-ceramic and monolithic wired glass.

The Real World

When safety glazing is specified, there is a lot to consider. Most of these decisions start with an architect, specifications writer, engineer, Authority Holding Jurisdiction, and so on.

Where the intent of these decision makers is to provide the safest product as dictated by the details of the project, the cost or aesthetics do not always come into focus until the manufacturer or installers get involved, such as:

- Distortion is caused by thin tempered glass and/or multiple lites of tempered glass
- Exterior installations with exposed PVB edges can lead to delamination
- And...

LAMINATED SAFETY GLASS

Laminated safety glass, at its simplest form, involves the adhesion of two lites of glass to a polyvinyl butyl (PVB) interlayer, thus creating a single monolithic substrate. Laminated glass can be used on its own or as a part of an insulated glazing unit (IGU).

The purpose of laminated glass is to provide improved strength, stability, sound insulation, and a design aesthetic utilizing opaque or coloured interlayers

What makes Laminated Glass “Safety Glass?”

Safety glazing is a type of glass that has special properties because of how it is treated, manufactured, or both.

Laminated safety glass is comprised of either a combination of two lites or more of annealed glass or tempered glass, and sometimes a combination of both. The thickness of the glass and the overall substrate varies based on the location of install, code requirements, and the engineered installation method, among others.

The interlayer is also dictated by the same parameters, as some provide privacy, while others offer superior fall-out protection by keeping the entire substrate in place should both lites of glass break (i.e. SentryGlass Ionoplast Interlayer).

In areas of the home, such as door sidelights and sunlights, laminated safety glass helps keep the substrate in-place in the event of breakage. This helps provide security and allows for replacement without necessarily needing to be boarded up.

PFG Glass can provide an interlayer that will satisfy the needs of almost any project suitable for today's modern building requirements.

Annealed laminated glass IS Safety Glazing.

It is often the default of those familiar with tempered glass and its strength that this is the only option when manufacturing laminated glass, and that tempered glass-plus-lamination must mean **EXTRA STRONG**.

However, laminated glass is only as strong as the thickest piece of glass it is constructed of. The 3mm tempered glass in 6mm lami in a window is not as strong as 6mm tempered glass. What the lamination process offers is the ability to remain intact when impacted or during an event, such as an earthquake.

Tempered glass breaks into small pieces which helps to minimize harm. Laminated glass remains in place intact due to the adhesion of the interlayer. Annealed glass in lami may not be as strong, but if strength were the deciding factor in the choice of glass, tempered would win every time. But if the aesthetics of the view through the glass was more important to the occupants, annealed glass would come out on top.

PFG Glass works with their clients to offer pricing and options that may assist in the bid process, installation method, and end-user satisfaction.

Providing a full architectural glazing schedule at the quoting stage can provide vital information to our knowledgeable sales staff who can help you and your clients save time and money that can be lost at various stages of the project.

Some Key Benefits of Laminated Glass:

- Blocks 99% of UV-light transmission
- Sound reduction properties in both residential and commercial installations
- Security against forced entry
- Privacy with opaque interlayers vs. single-sided patterned or acid-etched glass
- 100% spandrel "back pans" where OPACI is installed in a vision area

Trosifol®

Trosifol® polyvinyl butyral (PVB) thermoplastic films are tough, resilient safety interlayers used in laminated architectural safety glass. These PVB interlayers offer similar safety advantages by retaining dangerous shards in case of glass breakage.

Trosifol® Translucent White (DFW - diffused white) PVB

offers a satin-etch-like appearance, providing an opaque white translucent appearance that offers privacy while being consistent in colour and easier to maintain than satin/acid etch. Trosifol® has a collection of whites to allow limited to zero light transmission, including a Brilliant Black option that can double of "back pan" for spandrel in vision areas.

Trosifol® SentryGlas® Ionoplast (SGP) interlayer is five times stronger and up to 100 times stiffer than conventional laminating materials. In a stand-off railing application, SGP will not collapse like a wet blanket when the glass is broken, offering superior fallout protection for guard rails or windows requiring a guard load at higher elevations or in areas where wind load is hazard. SGP will not delaminate when exposed to the elements. Strong enough to resist thieves and hurricane-force winds.** Available in Clear and Translucent White.

Trosifol® SoundControl offers the ability to design a building envelope to reduce sound transmission by lowering OITC ratings in urban areas, while also keeping private conversations private when designed as partition glass.

Vanceva®

With Vanceva® colour PVB interlayers, there is no end to the colour combinations you can create for your project. By combining single layers of coloured PVB, one stacked on top of the other, yellow and blue make green! Or aubergine, or chartreuse...you get the idea. With the ability to offer clear and opaque colour combinations, you can add a splash of colour to any project.

Whatever the project, PFG Glass can review your specifications and help guide you to a solution that will meet the requirements of the project, and even offer value-added alternatives that can help with cost or aesthetics.

