



Glass Buyer's Guide

Differences between working with a glass company versus a stair company	2
Glass materials	2
Design elements and structural components	3
Natural glass characteristics and quality levels	13
Code requirements.....	13



Differences between working with a glass company versus a stair company

Just like glass companies, we buy our glass direct from the manufacturers. There are only a handful of glass manufacturers in Chicagoland, and we have purchased from all of them, as well as from as far away as New Zealand when we have had unique needs including curved glass. Designed Stairs provides and installs glass rail jobs every month and has been installing glass rail for over 25 years.

Unlike most projects that a local glass company provides, such as mirrors or shower doors, glass rails require specific knowledge about the stair design and installation process in order to incorporate it into the stair. The various rakes and angles and structural attachments can be unique to each part of each stair, and not a standard measurement like glass doors would be.

Historically, glass companies use bulky and costly metal channels for the structural support required to attach glass rail to a stair. This is what you will often see in commercial buildings with glass rail. These heavy channels are used in some residences as glass has gained popularity, but there are other options for structural support that are more suitable for the design of a home. With Designed Stairs, you also have the option to use a structural wood channel.

Glass materials

Standard clear glass can be laminated, tempered, or both.

Low iron glass, also called Starphire or Ultra-clear has less green tint than standard clear glass especially when viewed from the edge, and can be laminated, tempered, or both.

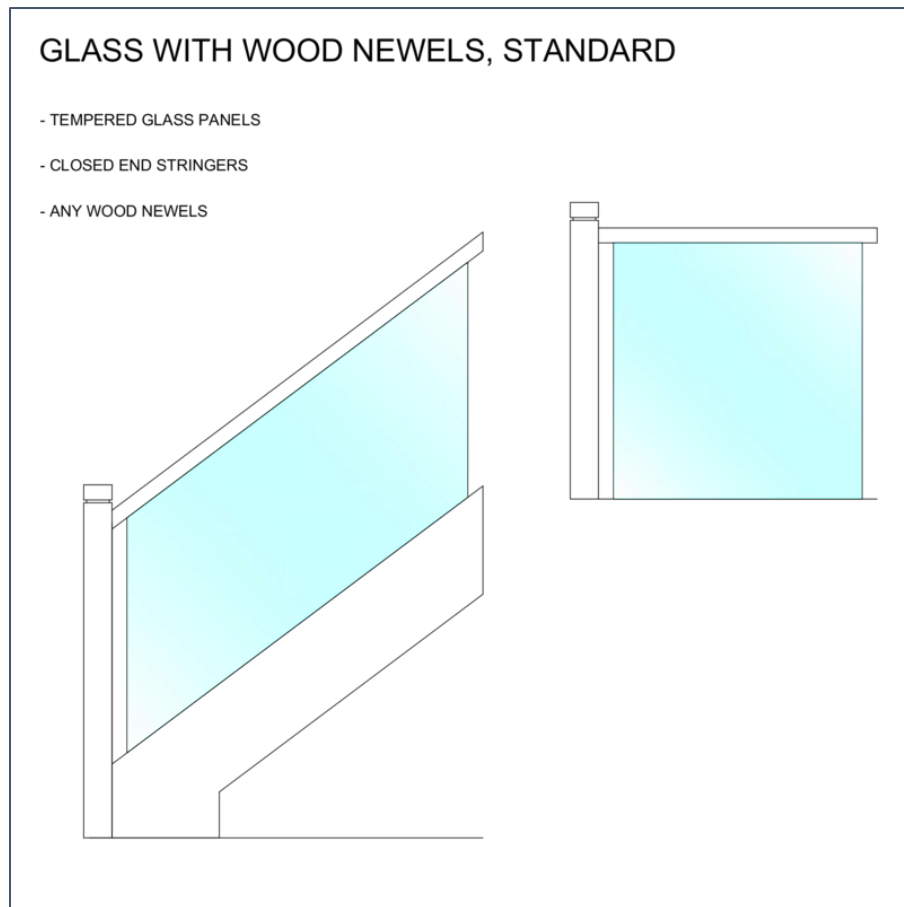
Specialty types such as Frosted glass (also called Acid Etched) can also be laminated, tempered, or both.

Other types of glass such as seeded or textured glass may not be able to be tempered and are available in limited panel sizes.

A flat polished edge with a small chamfer on the corners is recommended for the most flexibility with various rail installation methods.

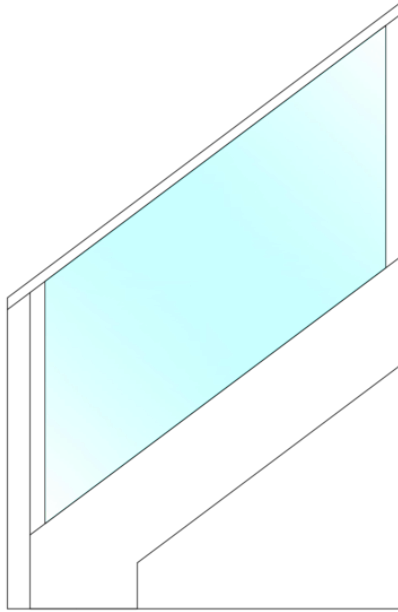
Design elements and structural components

Glass balustrades present a wide range of pricing based upon style, connection, and glass type. Glass panels require structural support which is provided by some combination of wood or iron newels, handrail, a channel in the stringer, metal clips, metal standoffs, and/or metal spigots. The style drawings below are in order of lower to higher priced designs.



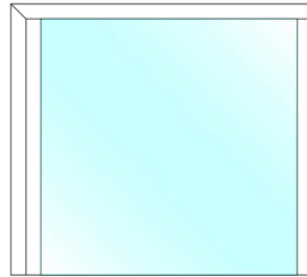
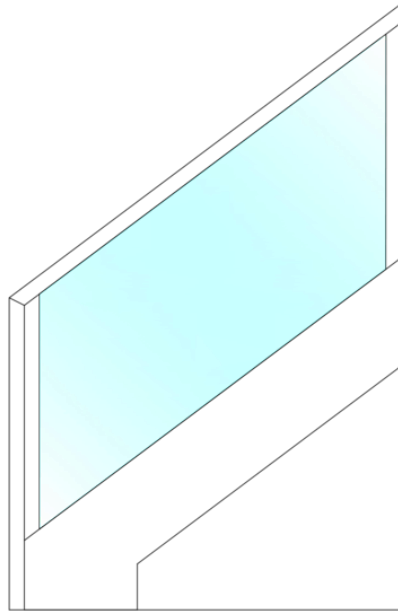
GLASS WITH WOOD NEWELS, RAIL OVER NEWEL

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS
- "U" STYLE WOOD NEWELS AND RAIL



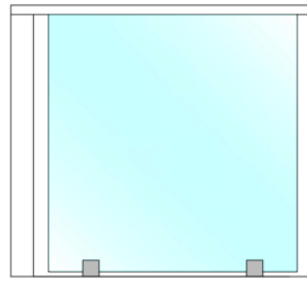
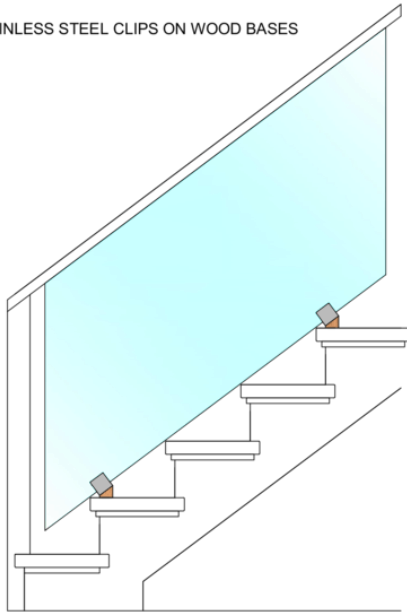
GLASS WITH RAIL RETURNING TO FLOOR

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS
- RAIL RETURNS TO FLOOR IN PLACE OF NEWEL



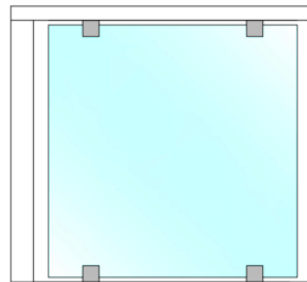
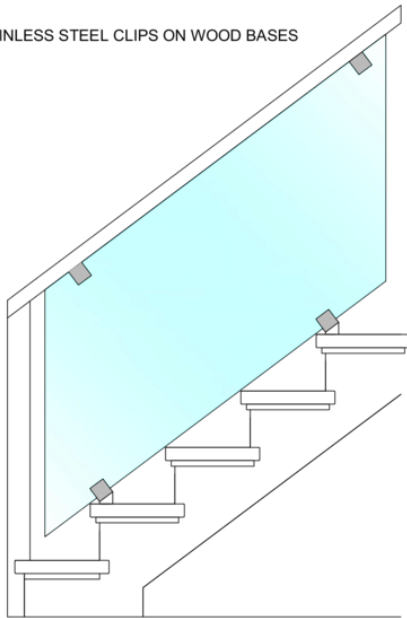
GLASS WITH CLIPS ON TREADS

- TEMPERED GLASS PANELS
- OPEN END STRINGERS
- ANY NEWELS
- STAINLESS STEEL CLIPS ON WOOD BASES



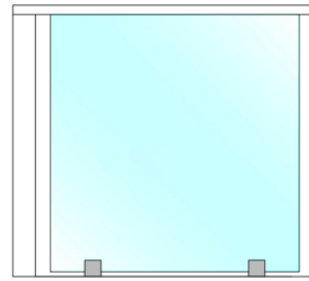
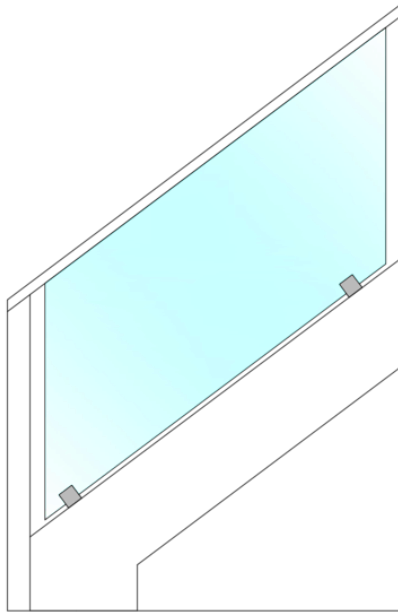
GLASS WITH CLIPS ON TREADS AND RAIL

- TEMPERED GLASS PANELS
- OPEN END STRINGERS
- ANY NEWELS
- STAINLESS STEEL CLIPS ON WOOD BASES



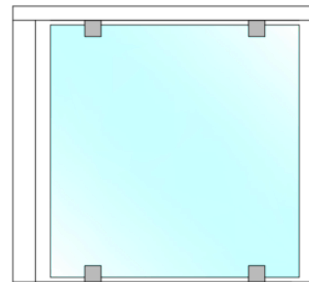
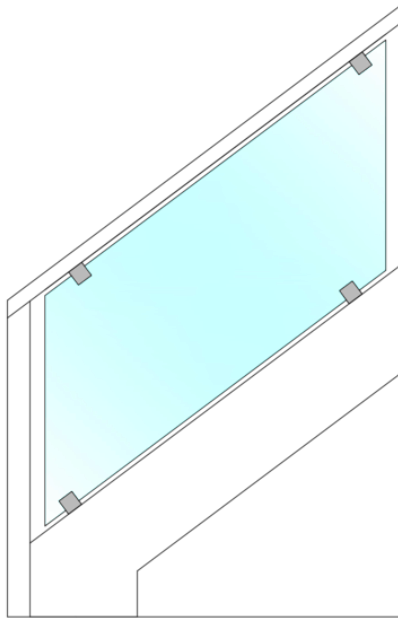
GLASS WITH CLIPS ON STRINGERS

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS
- ANY NEWELS



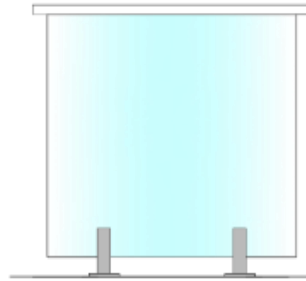
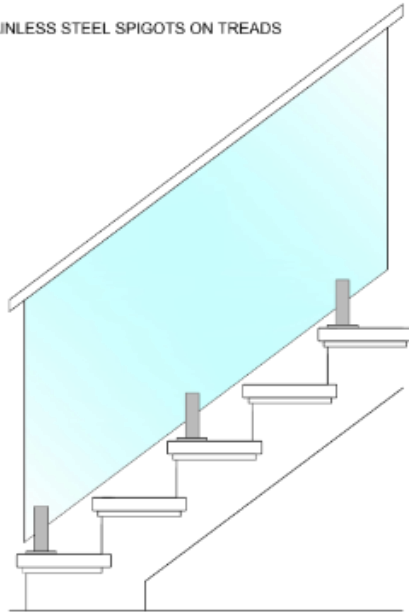
GLASS WITH CLIPS ON STRINGERS AND RAIL

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS WITH STAINLESS STEEL CLIPS
- ANY NEWELS



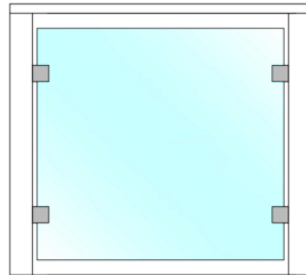
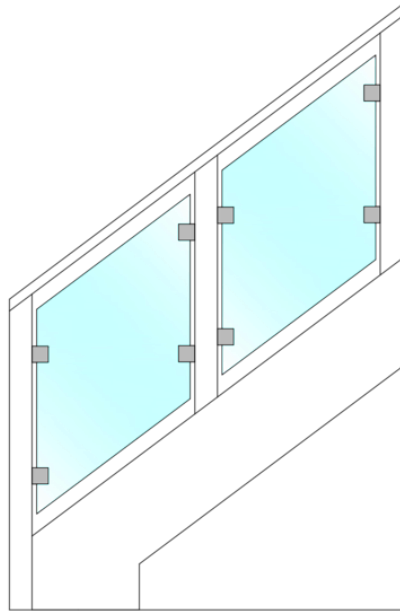
Spigot Clips for Glass

- TEMPERED GLASS PANELS
- OPEN END STRINGERS
- ANY NEWELS
- STAINLESS STEEL SPIGOTS ON TREADS



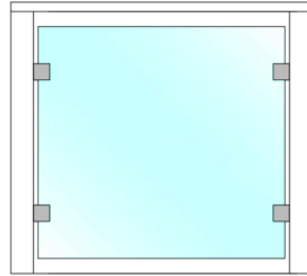
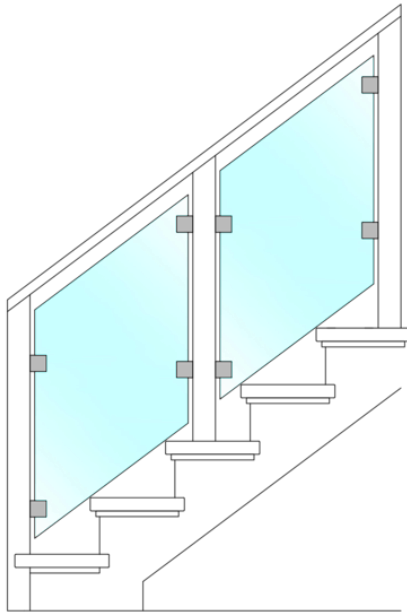
GLASS WITH CLIPS ON WOOD NEWELS (CLOSED END)

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS
- ANY SQUARE WOOD NEWELS WITH STAINLESS STEEL CLIPS



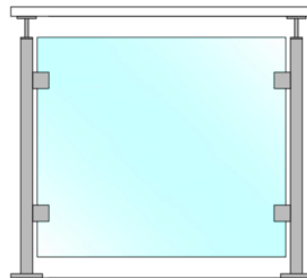
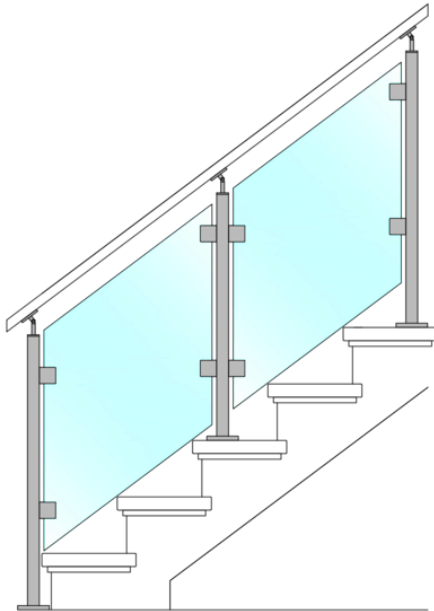
GLASS WITH CLIPS ON WOOD NEWELS (OPEN END)

- TEMPERED GLASS PANELS
- OPEN END STRINGERS
- ANY SQUARE WOOD NEWELS WITH STAINLESS STEEL CLIPS



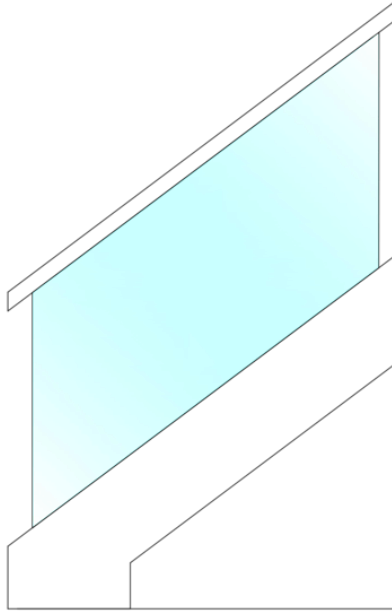
GLASS WITH CLIPS ON METAL NEWELS

- TEMPERED GLASS PANELS
- OPEN END STRINGERS
- STAINLESS STEEL NEWELS WITH STAINLESS STEEL CLIPS



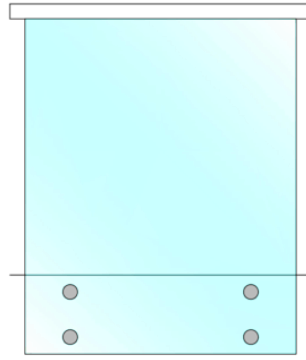
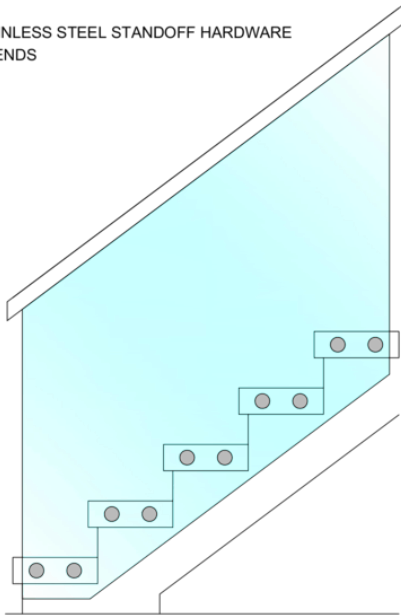
GLASS WITHOUT NEWELS

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS
- NO NEWELS



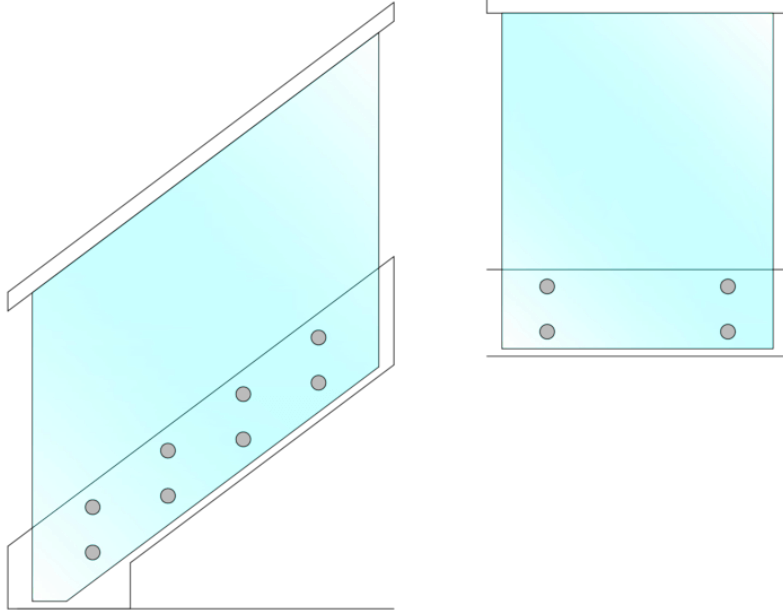
GLASS WITH STANDOFFS (OPEN END)

- TEMPERED GLASS PANELS
- OPEN END STRINGERS
- NO NEWELS
- STAINLESS STEEL STANDOFF HARDWARE ON ENDS



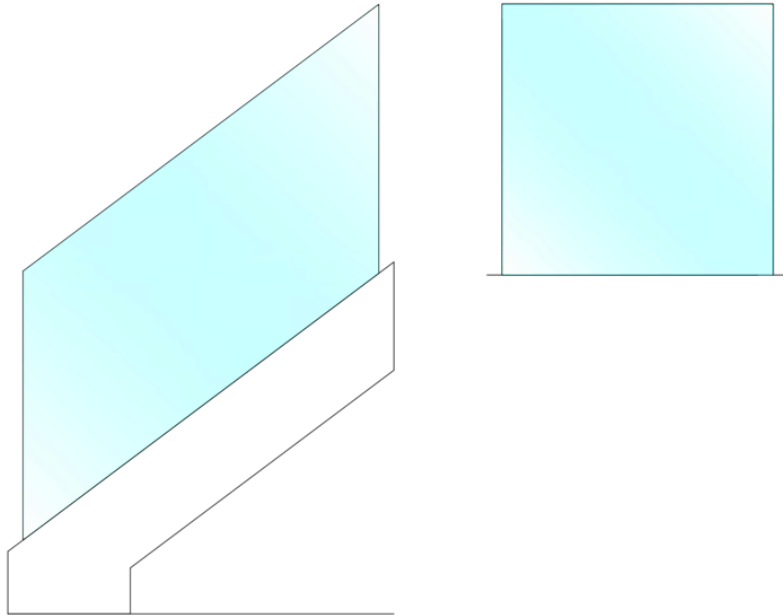
GLASS WITH STANDOFFS (CLOSED END)

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS WITH STAINLESS STEEL STANDOFF HARDWARE
- NO NEWELS



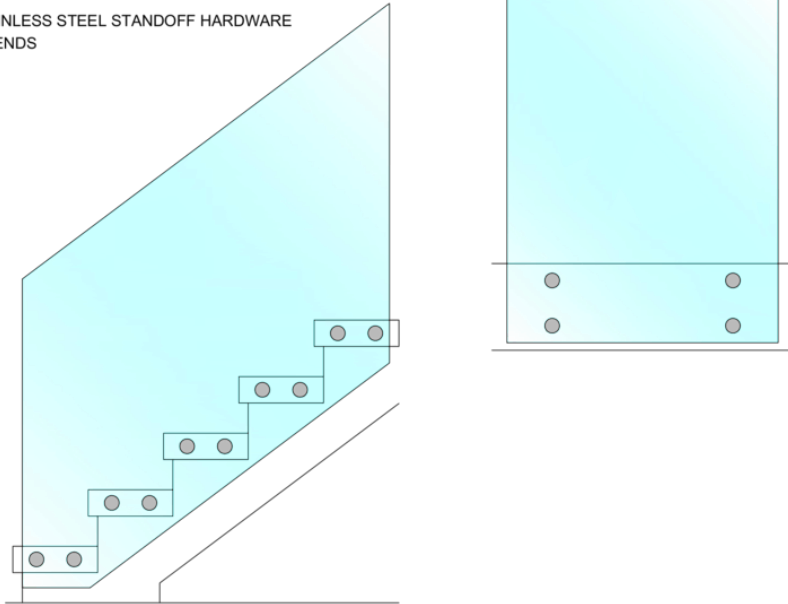
GLASS WITHOUT TOP RAIL

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS
- NO NEWELS, NO RAIL ON TOP OF GLASS



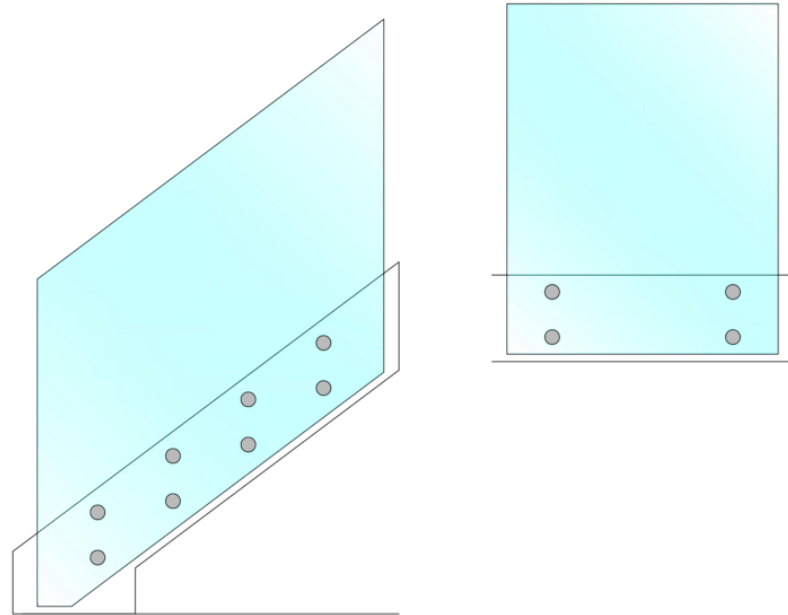
GLASS WITH STANDOFFS, NO TOP RAIL (OPEN END)

- TEMPERED GLASS PANELS
- OPEN END STRINGERS
- NO NEWELS, NO RAIL ON TOP OF GLASS
- STAINLESS STEEL STANDOFF HARDWARE ON ENDS



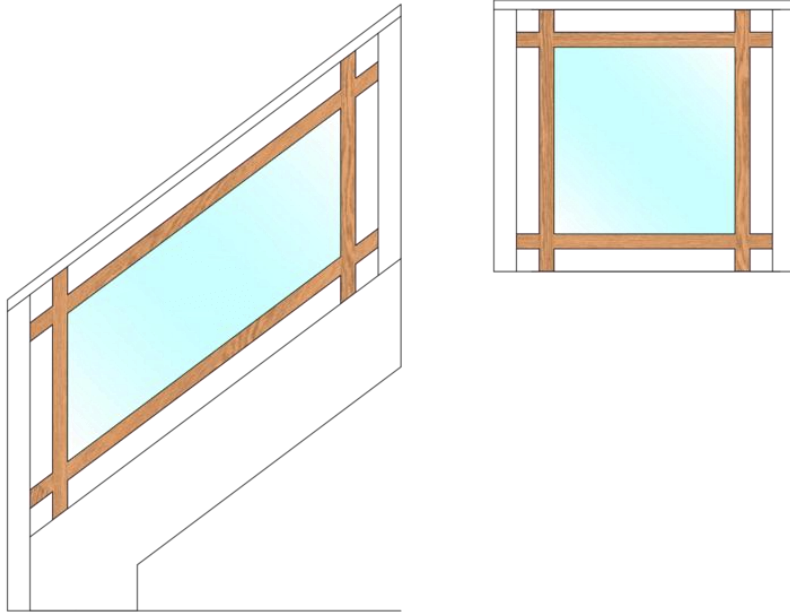
GLASS WITH STANDOFFS, NO TOP RAIL (CLOSED END)

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS WITH STAINLESS STEEL STANDOFF HARDWARE
- NO NEWELS, NO RAIL ON TOP OF GLASS

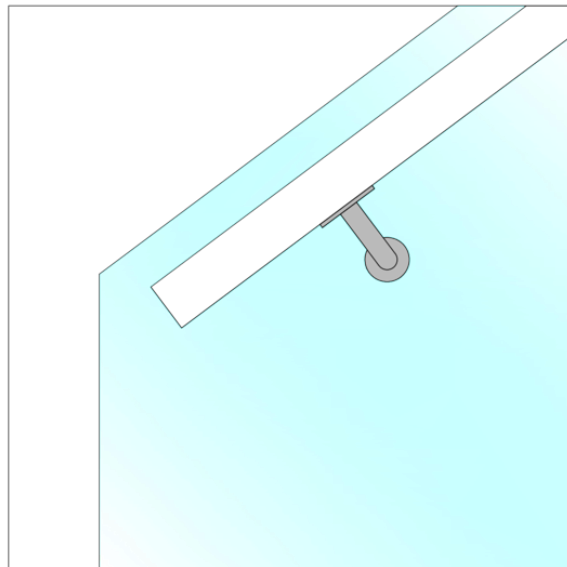


GLASS IN WOOD FRAME

- TEMPERED GLASS PANELS
- CLOSED END STRINGERS
- ANY SQUARE WOOD NEWELS



GLASS BALUSTRADE WITH NO
TOP RAIL MAY REQUIRE GLASS
MOUNTED RAIL (SHOWN BELOW)
OR WALL RAIL ON OPPOSITE SIDE
OF STAIR



Natural glass characteristics and quality levels

Since glass is made from natural materials, even manufactured glass can have natural character through the tempering process. Although these character marks can look like flaws, in the same way some see character in hardwood as flaws, there is a level of character that is considered acceptable.

Our glass rails meet or exceed the quality standards set by ASTM International for flat glass. With multiple pieces of glass installed side-by-side, slight differences in color and features caused by the tempering process may be noticed. How noticeable they are will largely be based on the light that shines on or through the glass. Glass rails also have several pieces of glass sitting next to each other, so there is a comparison effect - while one tempered piece could have one of these characteristics, its neighbor may have a different one. These characteristics are individual per piece and not a batch process that can be controlled.

These are a few characteristics that can be found in tempered glass which are considered by ASTM International to be normal and not indicative of defect:

Anisotropy refers to variations in the optical properties of the glass, which can cause slight color shifts or distortions when viewed in certain light conditions and from certain angles. It is common to find certain locations where this occurs as you approach panes of glass and likely occurs from very specific locations and angles. This is most common during the daytime with a natural light source. This is inherent to the tempering process and does not affect the glass's strength or safety.

Leopard Spots are small, irregularly shaped spots on the surface which are a natural result of the tempering process. They don't compromise the glass's integrity or safety and does not indicate any defects in the glass. The spots are likely seen from very specific locations and angles.

Distortion is often more noticeable in exterior glass and can be more easily seen on large buildings with glass exteriors. Slight waves or ripples may be visible in the glass surface.

Code requirements

Tempered glass is required by code on all glass rails. Tempered glass is a safety-engineered glass that is significantly stronger than standard annealed glass and is required by code for many applications including stair and balcony rail systems.

Proof of tempering will likely be required by the local inspecting authority. Proof is typically by a certification stamp etched on the corner of the glass panels. Tempered glass can only be etched during the manufacturing process.

The tempering process is a heat treatment that significantly increases the strength of glass by introducing comprehensive stresses on the surface. This process involves heating the glass to a high temperature and then rapidly cooling it, which creates internal stress within the glass which strengthens the glass.

Laminated glass is required for code in some situations, the most common being in commercial situations when the glass location is set overhead. When glass is laminated you can see layers when viewed from the edge and the polished edges are not as even as on standard glass edges.