

GLASS & GLAZING

There are nearly as many different variable considerations included within the topic of glass as with all other components of windows & doors combined. After all, glass is the most obvious part of any window and many doors include, at least some, glass.

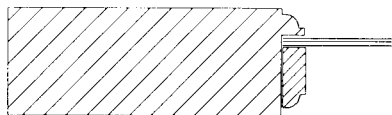
The following definitions and descriptions are separated into two basic categories, GLAZING OPTIONS & GLASS TYPES.

GLAZING OPTIONS:

The use of single and multiple layers of various types of glass within any given sash or door.

Generally, there are three common glazing configurations. They are Single, Double & Triple Glazing. As the names imply, Single Glazing includes one layer of glass, Double Glazing includes two layers and Triple Glazing includes three layers. Until the recent availability of various high performance materials, the greater the number of glass layers, the greater the insulating value of the window or door. Now, with the advent of such products as sealed insulating glass, Low E glass, Heat Mirror and others, insulating values can be enhanced without the use of multiple glass layers. Often, combinations of certain Glazing Options, Glass Types, Metallic Films and Chemical Gas Fillers can provide significant insulating efficiency.

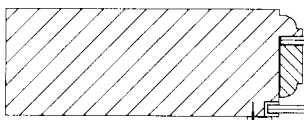
At Woodstone, virtually any combination or requirement can be included in a given window or door.



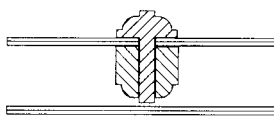
*SINGLE GLAZED WITH
WOODEN STOPS*



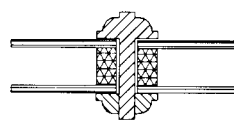
*SINGLE GLAZED WITH
GLAZING COMPOUND*



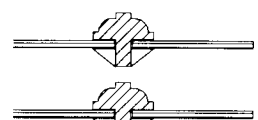
*DOUBLE GLAZED WITH
REMOVABLE STORM PANEL*



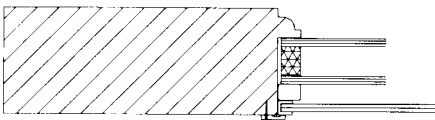
*DOUBLE GLAZED WITH
REMOVABLE STORM PANEL*



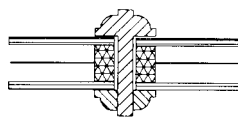
*DOUBLE GLAZED
WITH SEALED
INSULATING GLASS*



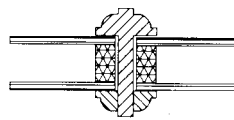
*DOUBLE GLAZED
WITH EXTERIOR
STORM SASH*



*TRIPLE GLAZED WITH
SEALED INSULATING GLASS &
REMOVABLE STORM PANEL*



*TRIPLE GLAZED WITH
HEAT MIRROR*



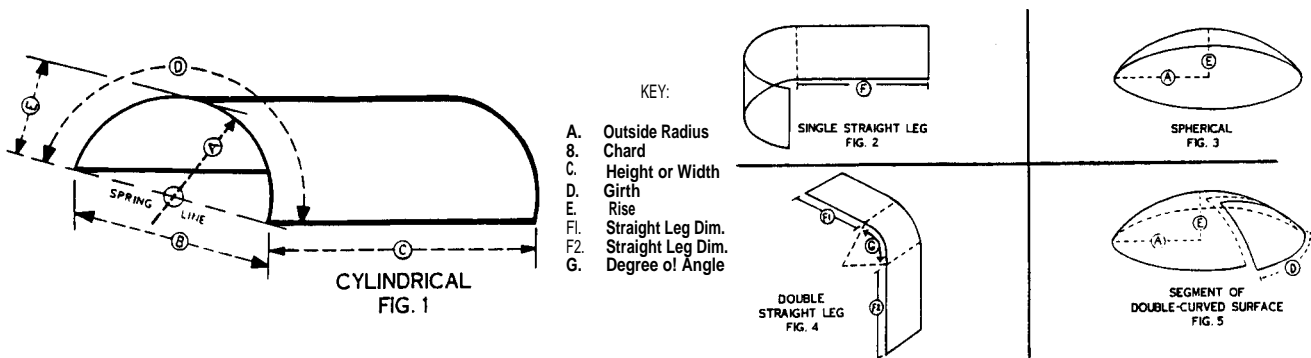
*TRIPLE GLAZED WITH
SEALED INSULATING GLASS &
EXTERIOR STORM SASH*

GLASS TYPES:

Specific descriptions of some of the many glasses that are currently available.

Antique: or restoration glass is either true antique glass that has been salvaged or it is authentically reproduced or artificially simulated. Slight distortions, occasional pits and other imperfections characterize most antique glass.

Bent: glass that is curved, bent at an angle, spherical or segmented portions of same.



Beveled: panels of straightline or curved glass with a beveled perimeter edge. Either machine or hand ground, bevel sizes are available from less than 1/2" inch in width to 11/2" and more. The beveled angle is variable and dependent upon the bevel width and the thickness of glass required. Generally, the wider the beveled edge, the thicker the glass.

Various glass types (ie. clear, tinted, mirror & Solarcool bronze) are available with beveled edges. Beveled glass can also be incorporated in sealed insulating panels and a wide variety of shapes and sizes are available.

Bull's Eye: or Crown Bullion is either authentic antique glass or simulated reproduction. Wave like distortions in the shape of concentric circles generally characterize this glass.

Etched & Frosted: glass that is rendered opaque from chemical wash or sandblasting. Often, intricate designs are permanently applied to various types of clear glass.

Fiberglass: is not real glass but rather includes epoxy resins and glass fibers. Available in various colors, fiberglass is not recommended for use in sealed insulating units because the various sealing agents may interact with the fiberglass and deteriorate.

Float: the most widely used method of molten glass manufactured.

Heat Mirror: one of the latest high performance glass products. This concept includes a sealed insulating unit of two layers of clear float glass with a soft-coat low e coating that is applied to one or two thin films suspended between the layers of float glass. When combined with Argon or Krypton gas in each cavity (there are at least two cavities separated by the thin low e film) reported R values can range as high as R-7 to R-10.

Insulating (Sealed): sealed insulating glass is one of the earliest methods for enhancing the efficiency of glass in windows and doors. The first double glazing patent was established in 1865.

Insulating glass consists either of welded glass (the two layers of glass are actually connected at the edges by a welded glass seam) or two layers of glass connected at the edges by a combination of desiccant with bituminous, butyl and/or silicon compounds. Woodstone seals are usually poly-isobutylene and silicone.

Generally, the welded glass method is not used in current applications. Insulated glass sealed with desiccant and compounds can be single or double sealed. Double sealed units are recommended for applications, such as large curtain walls, in which structural strength is required.

Leaded: a variety of glass that is assembled in usually intricate curved and straight line patterns and connected together with lead or other metallic came.

Leaded glass is usually associated with stained glass and is not recommended in unprotected applications. Sunlite decreases the strength of lead came causing the glass plane to warp and weaken. In many large windows, steel frames replace leaded came.

Low E: or low emissivity glass is another of the high-tech products with enhanced energy efficiency and includes a silver or metal oxide coating applied to one surface of clear float glass. There are two types of Low E coatings; soft-coat ("sputtered"), in which the metallic deposits are applied to the glass in a vacuum chamber, and hard-coat (pyrolitic) in which the coatings are applied directly to molten glass during the float manufacturing process.

Studies have shown that, while soft-coat Low E has a more efficient energy rating, hard-coat is more durable and resists scratching. See Heat Mirror for more information.

Mirror: glass with a reflective coating or backing material. One and two way mirror glass and is also available.

Opaque: a term that applies to a variety of opaque glass including, but not limited to, etched, tinted, obscure, frosted, painted and stained glass. There are many varieties of opaque or obscure glass.

Painted: usually clear and/or antique glass that is painted with custom coloration and kiln fired. Painted glass is often included with stained glass in intricate designs.

Plate: manufactured by the grinding and polishing process, is no longer produced in the United States having been replaced by the Float Glass process.

Plexiglass: or acrylic glass is generally available in several thicknesses. Plexiglass is often a substitute for safety glass. However, plexiglass scratches easily and can become brittle in cold temperatures.

Rolled: molten glass fed through rollers to produce desired thickness. Three general types include Figures/Patterned, Wired and Art/Opalescent/Cathedral glass.

Stained: glass that is manufactured with various pigments. Not to be confused with painted glass, stained glass contains its specific coloration during the molten state of glass manufacturing.

Standard Single & Double Strength: the most widely used float glass. Single strength glass is 3/32" thick and double strength glass is 1/8" thick. Usually specified as clear glass, quality grades include A, B & C. A grade is generally a custom order while B grade is the most widely used.

Safety Glass, Tempered & Laminated: glass required in high risk areas including automobiles, doors and adjacent areas, slope glazing, etc.

Tempered safety glass is heat treated, as the name implies. The heat treating process increases the strength of the glass by up to seven times that of standard float glass. Tempered glass is also rated by result of breakage into small pieces to reduce the risk of injury.

Laminated safety glass is usually two layers of glass with a plastic layer sandwiched between them. Some laminated glass is also tempered. Laminated glass is available in many thicknesses.

Check your local building codes for safety glass requirements.

Tinted: a general term referring to various float glass with metallic and reflective tints in a variety of colors.

For more information on specific types of glass & glazing, contact Woodstone's Customer Service Representative.