

Walk-In Display Windows



Overview

The glass industry and in particular the refrigeration window industry have made tremendous advances in the last 60 years. Window displays for walk-ins are more efficient and safer than they've ever been. Arctic carries a vast array of display solutions sourced from the best-known brands in the industry designed to meet current standards in walk-in energy consumption.

This article will explore glass as a material and will focus on current technologies and offerings from the walk-in window display industry. We'll determine how choosing the right window display, door, or a simple vision panel is an important decision for your business.

Types of Glass

SILICATE GLASS

- **Soda-Lime:** Typically used for windows, bottles, light bulbs, and jars
- **Borosilicate:** Commonly used for labware, household cookware, and sealed beam car head lamps
- **Lead:** Facilitates solubility of other metal oxides and is used in colored glass
- **Aluminosilicate:** Extensively used for fiberglass, used for making glass-reinforced plastics (boats, fishing rods, etc.), top-of-stove cookware, and halogen bulb glass
- **Glass-ceramics:** Imperviousness to thermal shock. Extremely useful for countertop cooking and industrial processes.
- **Fiberglass:** Uses include building and construction materials, boat hulls, car body parts, and aerospace composite materials.

NON-SILICATE

- **Amorphous metals:** Amorphous metals are non-crystalline and have a glass-like structure. But unlike common glasses, which are typically electrical insulators, amorphous metals have good electrical conductivity, and they also display superconductivity at low temperatures.
- **Polymers:** For many applications, like glass bottles or eyewear, these are a lighter alternative to traditional glass.

Safety Glass

TEMPERED GLASS

Tempered or toughened glass is a type of safety glass processed by controlled thermal or chemical treatments to increase its strength compared with normal glass. Tempering puts the outer surfaces into compression and the interior into tension. Such stresses cause the glass, when broken, to shatter into small granular chunks instead of splintering into jagged shards as ordinary annealed glass does. The granular chunks are less likely to cause injury. Tempered glass is used for its safety, strength, and superior thermal resistance in a variety of applications, including passenger vehicle windows, shower doors, aquariums, architectural glass doors and tables, refrigerator trays, mobile phone screen protectors, bulletproof glass components, diving masks, plates and cookware, and in **walk-in cooler and freezer applications**.

LAMINATED GLASS

Laminated glass is used for architecture, glazing, automobile safety, photovoltaic, UV protection, and artistic expression. The most common use of laminated glass is skylight glazing and **automobile windshields**. In geographical areas requiring hurricane-resistant construction, laminated glass is often used in exterior storefronts, curtain walls, and windows. An additional property of laminated glass for windows is that an adequate TPU, PVB or EVA interlayer can block nearly all ultraviolet radiation. A thermoset EVA, for example, can block up to 99.9% of all UV rays!



Insulated Glass

Insulated windows are typically manufactured with glass in thicknesses from 3 to 10 mm (1/8" to 3/8"). Thicker glass is used in special applications. A window with insulating glass is commonly known as double glazing or a double-paned window, triple glazing or a triple-paned window, or quadruple glazing or a quadruple-paned window, depending upon how many panes of glass are used in its construction. Laminated or tempered glass may also be used as part of the construction. Most insulated windows are produced with the same thickness of glass on all panes but special applications such as acoustic attenuation or security may require different thicknesses of glass to be incorporated in a unit. The space in between the panes provides the bulk of the insulation effect and may be filled with air or gas or a vacuum may be employed.

GLASS

Low emissivity glass (low E glass) are generally metallic coatings, usually applied onto the second or third glass surfaces of the unit that have the effect of reflecting infrared, and this can significantly improve the insulation value of the overall unit. These coatings also block portions of the infrared, ultraviolet and attenuate the visible light spectra. Two types of low E glass are available, hard coatings and soft coatings.

SPACERS

The glass panes are separated by a "spacer". A spacer, which may be of the warm edge type, is the piece that separates the two panes of glass in an insulating glass system and seals the gas space between them. A spacer that reduces heat flow in glazing configurations may also have characteristics for sound dampening where external noise is an issue. Typically, spacers are filled with or contain desiccant to remove moisture trapped in the gas space during manufacturing, thereby lowering the dew point of the gas in that space and preventing condensation from forming on surface #2 when the outside glass pane temperature falls. New technology has emerged to combat the heat loss from traditional spacer bars, including improvements to the structural performance and long-term-durability of improved metal (aluminum with a thermal barrier) and foam spacers.

GAS FILLING

A commonly used way to improve insulation performance is to replace air in the space between panes with a lower thermal conductivity gas. Monatomic gases such as Argon, Krypton and Xenon are often used. Argon is almost 1% of the atmosphere and isolated at a moderate cost. Krypton and Xenon are only trace components of the atmosphere and very expensive. All of these "noble" gases are non-toxic, clear,

odorless, chemically inert, and commercially available because of their widespread application in industry. Argon is commonly used in insulated glazing as it is the most affordable. Krypton, which is considerably more expensive, is not generally used except to produce very thin double glazing units or extremely high performance triple-glazed units. Argon is economic, increases efficiency, reduces condensation and is safe making it the standard choice on insulated window units for walk-ins.

MANUFACTURING

- Window units are often manufactured on a made to order basis on factory production lines, but common sized standard units are available.
- On the assembly line, spacers of specific thicknesses are cut and assembled into the required overall width and height dimensions and filled with desiccant. On a parallel line, glass panes are cut to size and washed to be optically clear. An adhesive, primary sealant (polyisobutylene) is applied to the face of the spacer on each side and the panes pressed against the spacer.
- If the unit is gas-filled, two holes are drilled into the spacer of the assembled unit, lines are attached to draw out the air out of the space and replacing it (or leaving just vacuum) with the desired gas. The lines are then removed, and holes sealed to contain the gas.
- A modern technique is to use an online gas filler, which eliminates the need to drill holes in the spacer.
- The purpose of primary sealant is to keep insulating gas from escaping and water vapor from entering.
- The units are then enveloped on the edge side using either polysulfide or silicone sealant or a similar material as secondary sealant which restrains movements of the rubbery-plastic primary sealant.
- The desiccant will remove traces of humidity from the air space so that no water appears on the inside faces (no condensation) of the glass panes facing the air space during cold weather.

Walk-In Coolers & Freezers Application

ENERGY EFFICIENCY

U-value is a measure of a material's ability to transfer heat. A window with a low U-value is better than a window with a high U-value. Most single-pane windows have a U-value of about one. Adding another pane of glass (referred to as double-glazing) will lower the U-value to about 0.5. By adding yet another pane of glass (triple glazing), the U-value decreases to about 0.31. The U-value of window units is the heat flow at the center of the glass, and this is generally lower than overall U-value of the window.

EMISSIONS

Emissivity refers to a surface's ability to radiate energy and is expressed as a value between zero and one. The emissivity of clear glass is about 0.85. A low-emissivity coating can reduce that to about 0.15, reducing the U-value of a double-glazed window from 0.5 to almost 0.3. One common method of reducing heat gain or loss through windows is by coating the glass with an invisible, heat-reflective material. This type of glass is called low-emissivity, or **Low-E glass**. These "low-emittance" (Low-E) coatings are microscopically thin, virtually invisible, metal or metallic oxide layers deposited on a window surface primarily to reduce the radiating heat flow.

REGULATIONS & STANDARDS

In April 2014 the U.S. Department of Energy (DOE), in an effort to reduce greenhouse gases and slow climate change, developed energy-efficiency standards that set new levels of maximum allowable energy consumption for commercial refrigeration equipment. These new standards pushed manufacturers of walk-in display windows to drastically improve their designs. The results are the most efficient displays we've had available yet, with the best manufacturing technologies and durability the market has to offer.

LIGHTING

Light to a window display is like milk to coffee. Two different things yet they complement each other very well. A display window serves little purpose if lighting is inappropriate or inefficient. Luckily with the current advances in technology in the lighting industry (LEDs) - better luminance, truer colors, low energy consumption and lighting systems that occupy little space are the new norm. Read our [Lighting In Walk-ins Article](#) to learn more about this topic.

VISION PANELS

Vision panels can be installed on swing doors, sliding doors, bi-parting doors and on walls depending on the application and the desired purpose. Door vision panels help minimize ingress/egress accidents and are an ideal solution for walk-in cooler and freezer applications. Arctic offers high quality and energy efficient [vision panels](#) of different sizes. A sales representative from Arctic's team would be glad to assist in a selection that is sure to accommodate the needs of almost any application.

Most common standard features for vision panels include:

- Common sizes: 14"x14" & 14"x24"
- Brushed aluminum frames
- Tempered triple pane glass
- Argon filled space between glass for added efficiency
- Heated and Unheated models



Display Reach-In Glass Doors

As expressed by Anthony®, one of the industry's best and highly regarded window display manufacturers, and one of Arctic's window display vendors: "While the eyes may be the windows to the soul, it is the grocery store and supermarket retailer's cooler doors that can be the windows to a healthier bottom line – in more ways than one, but only if the proper technology is deployed. The cooler doors on reach-in cases or walk-in coolers are a critical point of interaction with the customer. First, they allow the shopper to view the products that are displayed inside the cooler, followed by an actual physical interaction as the shopper grabs the handle, pulls open the door and reaches in for the desired item"

At Arctic, we pride ourselves on offering only the best components for our walk-in boxes. This guarantees that our suppliers' must uphold the same high quality standards we strive for in the products we manufacture. Anthony® reach in display doors come in many different sizes and configurations.

Some of the most common features are:

- 2-pane glass pack with Argon gas 75°F, 55% rh ambient / for 35°F walk-ins
- 3-pane Low E glass pack with Argon gas 75°F, 55% rh ambient / -10°F walk-ins
- Door Air Shield Technology for advanced Anti-condensate Sweat Protection

- Heated Frame Rail
- Widths of 24", 26", 28", and 30" bi-swing configuration available for walk-in coolers or reach-ins with center mullion
- Heights of 67", 75" & 79"
- Highly energy efficient LED Innovative lighting to increase the visual impact of the product while reducing energy consumption
- Magnetic Aircell PVC Gasket for Tight Seal
- Epoxy-coated shelves with matching price tag molding, galvanized steel posts, and shelf brackets.
- Reversible Door Swing
- Doorstop feature limits door opening to 87° to minimize impact with adjacent doors and shoppers
- Automatic hold-open provides shoppers with easy access to merchandise and allows for easy stocking

Some common available options & upgrades:

- Matching Pass-Thru Door Available in widths 30", 33", 36" and 38"
- Optimax 7 Standard Power LED
- Satin Silver Anodized Finishes
- Full-Length Handle
- Electronic Auto-Lock
- 27" or 36" Deep Shelving
- Epoxy-Coated Shelf Posts
- Gravity Flow Shelving
- Roll-A-Way Cart

Take Away

Glass is a unique and beautiful human discovery that has enabled us to do unimaginable things. A display window in a walk-in brings enormous benefits to any business. The worries of the past about safety, energy losses and low efficiency have been put to rest with advanced technologies in materials, LED lighting, gas filled window units and beautiful designs that will guarantee the best ROI on any project. The Arctic Sales team has a group of professionals available to assist on the best choices and offerings from the window display industry to meet the needs of your project.

References

- www.en.wikipedia.org/wiki/Glass
- www.anthoniyintl.com/en/index.aspx
- www.replacementwindowsmpls.com/
- www.ngext.ksu.edu/buildingenvelope/windowsanddoors