

Case Study: Glass

History of glass:

The ancient Roman historian Pliny suggested that Phoenician merchants had made **the first glass** in the region of Syria around 5000BC. But according to the archaeological evidence, the first man made glass was in Eastern Mesopotamia and Egypt around 3500BC and the first glass vessels were made about 1500BC in Egypt and Mesopotamia. For the next 300 years, the glass industry was increased rapidly and then declined. In Mesopotamia it was revived in the 700BC and in Egypt in the 500's BC. For the next 500 years, Egypt, Syria and the other countries along the eastern coast of the Mediterranean Sea were centers for **glass manufacturing**.

History of glass windows:

Paper windows were economical and widely used in ancient China, Korea and Japan. In England, glass became common in the windows of ordinary homes only in the early **17th century** whereas windows made up of panes of flattened animal horn were used as early as the **14th century**.

Modern windows are usually glazed or covered in some other transparent or translucent material. Windows are held in place by frames.^[2] Many glazed windows may be opened, to allow ventilation, or closed, to exclude inclement weather.^[3] Windows often have a latch or similar mechanism to lock the window shut.

Types include the eyebrow window, fixed windows, single-hung and double-hung sash windows, horizontal sliding sash windows, casement windows, awning windows, hopper windows, tilt and slide windows (often door-sized), tilt and turn windows, transom windows, sidelight windows, jalousie or louvered windows, clerestory windows, skylights, roof windows, roof lanterns, bay windows, oriel windows, thermal, or Diocletian, windows, picture windows, emergency exit windows, stained glass windows, French windows, and double- and triple paned windows.

The Romans were the first known to use glass for windows, a technology likely first produced in Roman Egypt, in Alexandria ca. 100 AD. Paper windows were economical and widely used in ancient China, Korea and Japan. In England, glass became common in the windows of ordinary homes only in the early 17th century whereas windows made up of panes of flattened animal horn were used as early as the 14th century. In the 19th century American west, greased paper windows came to be used by itinerant groups. Modern-style floor-to-ceiling windows became possible only after the industrial plate glass making processes were perfected.

Construction:

Windows can be a significant source of heat transfer.^[19] Therefore, insulated glazing units consist of two or more panels to reduce the transfer of heat.

Glazing:

Low-emissivity coated panes reduce heat transfer by radiation, which, depending on which surface is coated, helps prevent heat loss (in cold climates) or heat gains (in warm climates).

High thermal resistance can be obtained by evacuating or filling the insulated glazing units with gases such as argon or krypton, which reduces conductive heat transfer due to their low thermal conductivity. Performance of such units depends on good window seals and meticulous frame construction to prevent entry of air and loss of efficiency.

Modern double-pane and triple-pane windows often include one or more low-e coatings to reduce the window's U-factor (its insulation value, specifically its rate of heat loss). In general, soft-coat low-e coatings tend to result in a lower solar heat gain coefficient (SHGC) than hard-coat low-e coatings.

Mullions:

Modern windows are usually glazed with one large sheet of glass per sash, while windows in the past were glazed with multiple panes separated by *glazing bars*, or *muntins*, due to the unavailability of large sheets of glass. Today, glazing bars tend to be decorative, separating windows into small panes of glass even though larger panes of glass are available, generally in a pattern dictated by the architectural style at use. Glazing bars are typically wooden, but occasionally lead glazing bars soldered in place are used for more intricate glazing patterns

Between to objects is a mullion that is used to divide units of a window, door, screen, etc. The main purpose of a mullion is to provide structural support to an arch or lintel above the window opening. The other reason would be support for the glazing of the window. Along with the mullions are window grids that just go on the window and create a grid look pattern. A window grid comes in different patterns or shapes. The most common basic is the square grid.

Different types of glass:

Not all windows need to have a divider in between. However glass windows in apple do not have a divider going between the two glass panels. One way glass could be put on buildings without having a divider in between would be butted glass. Butted glass is when the glass is bending or seemed together with just another piece of glass. Having butted glass is nice to use because it can create a person's eyes to draw to a specific view that the architect is trying to capture.



Evidence Cited- Architect of Modernism

<http://www.historyofglass.com/>

<https://en.wikipedia.org/wiki/Window>

<https://www.bing.com/search?q=butted+glass+windows&FORM=HDRSC1>