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GREENHOUSE GLAZING

The first food-producing greenhouse on record was built sometime between 14 and 37 A.D. Its sole purpose was to provide the Roman Emperor Tiberius Caesar with the daily cucumber his doctor prescribed. It was a pit greenhouse covered with transparent stone—possibly mica or alabaster. Other than this early recorded use, very little else was done with trying to modify structures to grow plants for many centuries.

In 1599 that the first practical greenhouse was designed by Jules Charles a French botanist. It was built in Leiden, Holland and used primarily to grow medicinal tropical plants. Since this early invention, many different variations on “glass houses” have produced fruits, vegetables and flowers and other plants during the cold seasons of the year.

Glazing is the transparent or translucent part of the greenhouse that lets in the light. Since the plants will not grow without light, choosing the greenhouse cover is critical to growing success. It is the most visible and extensive part of the structure so chose it carefully because it impacts the cost and the permanence dramatically. Consider the long term costs when making your selections.

Glass is exceptionally well adapted for greenhouse glazing. Glass is the traditional greenhouse covering against which all others are judged. As mentioned, structures were originally known as glasshouses and had wooden sashes with small inset panes. That construction technique has changed because larger panes are less fragile than smaller panes.

Many greenhouses are covered with double-strength float glass (1/8 inch thick) costing $0.85 to $2.00 per square foot. Large glass panes in many more expensive greenhouse kits are tempered glass (5/32 inch thick) costing $3.00 to $7.00 per square foot, depending on the pane size.

Glasshouses waned in popularity, but are popular once again. They are unsurpassed in quality, light transmission, and durability. Modern windows are usually double glazed and fit much tighter. This reduces energy costs and helps reduce temperature extremes that interfere with plant growth.

Glasshouses require careful construction. Use tempered glass to prevent serious injuries in the event of breakage. Sliding glass door panels are widely used because they are strong and constructed from tempered glass.

The drawbacks are that it is breakable, very expensive, heavy and difficult for homeowners to fabricate. Most of these disadvantages can be overcome with proper design. Because of its weight, it requires sturdier framing support than is required with other covering materials.

Inexpensive coverings are easily constructed with polyethylene plastic. It is a good choice for home-built greenhouses because less structural support is required and it costs much less than
other materials. Construction grade film may suffice for a few weeks while growing spring transplants. It degrades rapidly in ultraviolet light and will suddenly break in many pieces. If this happens in midwinter, your plants are finished, as they will quickly freeze.

Ultraviolet-stabilized polyethylene coverings will last for several years when installed correctly. The disadvantage of these products is that they are only readily available in 100-foot rolls. This covers a small greenhouse many times over. The covering comes in widths from 10 to 50 feet, thicknesses from 1 to 8 millimeters, and costs $0.06 to $0.09 per square foot.

Two layers of polyethylene are used to reduce heat demands. Double-layer houses cost 30-40 percent less to heat than single-layered houses. Polyethylene can be installed on wood-frame greenhouses by nailing wood batten strips over the film into the foundation rafters or arches. However, because it must be replaced frequently, investing in special fasteners makes the job easier. Fastening systems are available for single or double-layer applications.

Some new double-wall plastic materials are excellent greenhouse coverings. Acrylic or polycarbonate double-layer structured panels are made of two layers of plastic held apart by ribs spaced 1/2 to 1 inch apart. The double-layer construction increases structural strength and heat retention but decreases light transmission compared to single-layer materials.

They are light in weight, have excellent insulation properties and are easily cut to size. They are expensive, and efficient installation requires using special hardware made by the manufacturer. Most will last 1-20 years with little reduction in light transmission. These include Polygal, Lexan and other brand names. Panels are 4 feet wide and up to 39 feet long. Polycarbonate panels cost $1.75-$2.50 per square foot, and those made of acrylic cost $2.00-$3.50 per square foot and some special types are even more expensive.

These plastics are expensive, but are lightweight and virtually indestructible. The disadvantage is that they must be used with the manufacturer’s supplied hardware rather than materials obtainable at local lumber or hardware stores.

Regular flat acrylic sheets are difficult to use because they expand and contract with the heat and cold. Corrugated acrylic sheets are excellent because they are not very flammable, they remain clear and are highly resistant to breakage. Their disadvantage is that they are not well insulated.

Corrugated fiberglass is a popular greenhouse construction material. Common builders’ grades quickly turn dark and are unsuitable for anything besides temporary construction. An even bigger disadvantage is flammability. It almost explodes once it catches fire. Reserve this glazing for freestanding structures located away from the home.

Select corrugated fiberglass panels with an ultraviolet-resistant coating for greenhouses. Buy greenhouse quality fiberglass coated with Filon or Tedlar for long life and high light transmission. Fiberglass panels are available in 24- to 57-inch widths and up to 24-foot lengths. They are durable, retain heat better than glass does, and are lightweight.

Light transmission may be better than glass simply because less structural support is needed, which creates fewer shadows. Large panels are flexible enough to be applied to a Quonset greenhouse. The prices ranges from $1.00 to $1.25 per square foot, depending on the guaranteed life span of the material. Inexpensive materials may be guaranteed for as little as 5 years; more
expensive types may be guaranteed for as long as 20 years.

Greenhouse glazing comes in many styles and types. Selecting the best one for your structure is not easy, but if done correctly it provides an excellent growing environment for plants and a comfortable place for you to enjoy.

The framing materials for your greenhouse are influenced by the type of covering material. Make certain the materials are strong enough and durable enough for the covering. Expensive glass panels are wasted if they are supported with ordinary pine lumber that will rot in a few seasons.

Schedule 80 PVC pipe can also be used as supports for small Quonset-style greenhouses that are to be covered in polyethylene but PVC requires extra support to withstand strong winds. Spend the extra money and get ultraviolet stabilized pipe so it does not turn brittle and break when exposed to the sunlight. The pipe is available from larger plumbing supply houses.