

A-1 ALUMINUM INC.

Window Properties and Design

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The doors and windows that are right for you will depend on the climate you live in and the design of your house.

Windows can make or break a building project. Choose wisely and your home will be comfortable, attractive, and easy to maintain. Buy the wrong ones and you can spend more than you need to up front or in higher utility bills for years to come.

Windows and Energy

Windows should let light in and keep weather out. That's a tall order, because glass has almost no insulative value and is a poor barrier to radiant energy. So, if you can't control the way energy passes in and out through your windows, you won't be comfortable in your home. While some people augment compensate for inadequate windows by using their heating and cooling systems, this doesn't produce true comfort, and means spending more on utilities.

Cold Climate Design

By design, cold climate windows should help keep heat in a building. U-value is the energy term used to describe a unit's ability to prevent heat loss through the glazing or glass, sash, or frame. Choosing a unit with the wrong U-value is like wearing a swimsuit in a blizzard: There's not much keeping the heat in. Heat can also escape through windows as radiant energy. Warm is attracted to cool, so radiant energy from people and objects is drawn out through the glass. You can actually feel this happen when the air temperature is warm, but you feel chilly whenever you approach a window.

Another way to increase efficiency is to use insulated glass units (IGUs), or windows with an air pocket sealed between two layers of glass. The trapped air insulates much like a layer of down in a coat. In gas-filled IGUs, manufacturers use exotic gases like argon or krypton to fill the pocket and achieve lower U-values.

Hot Climate Design

In a hot climate, the goal is to keep heat out. One way heat enters a building is by conduction, when cool inside air comes in contact with warm exterior glazing. Again, the cool air draws in the warmth, defeating the cooling effect indoors. A lower U-value makes this less likely to happen. Solar heat gain happens when radiant energy from direct or reflected sunlight enters through the window glass. High-tech prevention is available in low-e coatings which prevent the passage of radiant energy or solar heat into the home. An easy, low-tech solution is to minimize the amount of sun that hits your windows. Shading the windows with vegetation, awnings, or overhangs such as porches and eaves provides respite from the sun's burning rays. Another option is to decrease the size and number of windows on the east and west sides of the building.

Ventilating Windows

Most windows open and close so bring air flow to your home. Operable units open many different ways. Double hung windows slide up and down, while sliding units move from side to side. Casement and European-style windows swing in

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or out like doors. Hopper and awning units are hinged to tilt in from the bottom or out from the top. Windows and doors are major architectural elements, so be sure to choose those that match the design of your home. For example, a 1920's bungalow looks utterly ridiculous with modern sliders. Likewise, a 1960's ranch may look silly with the multi-paned double-hung units commonly found on a colonial.

Material and Design

The material employed for sashes, frames, and doors affects energy efficiency, durability, aesthetics, and cost. Wood is often used for doors and windows. It's paintable, stainable, and a good thermal insulator. Unfortunately, it rots if you don't keep paint on it. Steel and aluminum are strong, durable materials for windows, but both have fallen out of favor because of the way they conduct heat and cold. Vinyl is cheap, durable, and relatively energy efficient. You can't paint it, but it does come in a number of colors. Fiberglass windows, while expensive, are durable, paintable, and strong. Wood windows clad or faced in vinyl or aluminum is another option. The cladding enhances the durability of the window without compromising the thermal performance and design flexibility of wood.

It is critical to keep design and style in mind when selecting windows for your home. Windows are a huge investment and will significantly impact the look, feel, and operation of your home, so take the time before you buy to select a material, style, and model that is right for you.