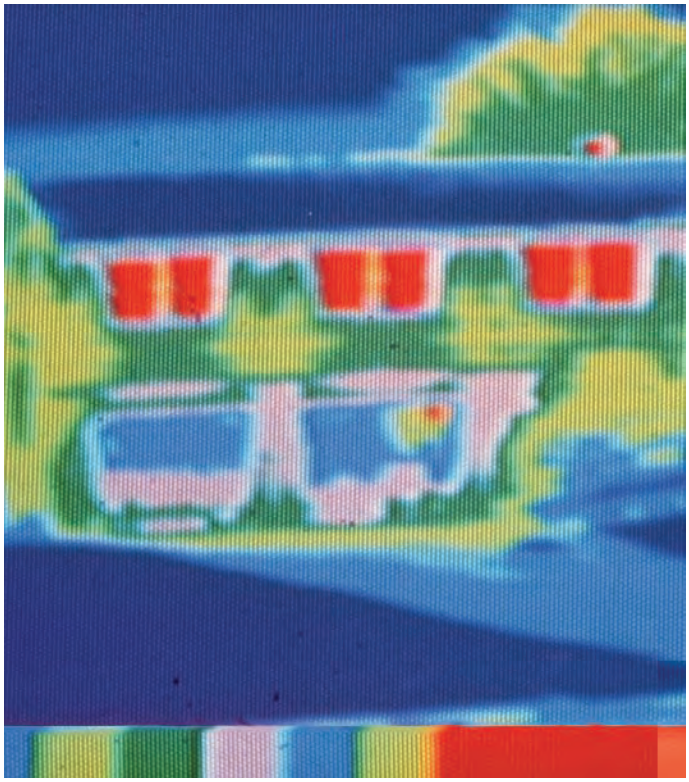
WEB BASED
APPLICATION SPECIFIC
INSTALLATION INSTRUCTIONS



Reducing Energy Use

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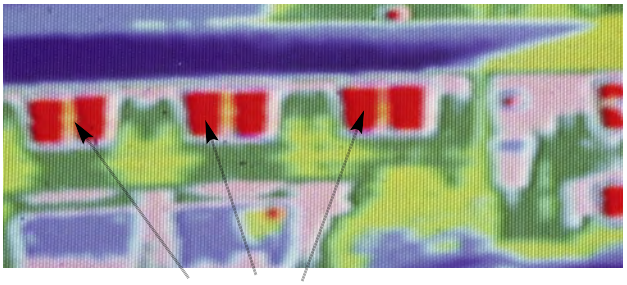
Window Efficiencies

When consumers think about replacing their old windows, its probably because of one or more of four reasons:

1. They want to **increase comfort and reduce heat loss** in Winter **and reduce heat gain** in Summer
2. They want to **improve the operation of their windows and reduce the needed maintenance**
3. They want to **improve the appearance of their home**, and add some new architectural design
4. They want to **reduce the noise**, and even **increase security** in their home.

Any - or all - of these reasons are sufficient enough for the average owner of a 7-year old or older home to replace the windows in their home with new, energy efficient, maintenance-free, stylish Vinyl Replacement Windows.

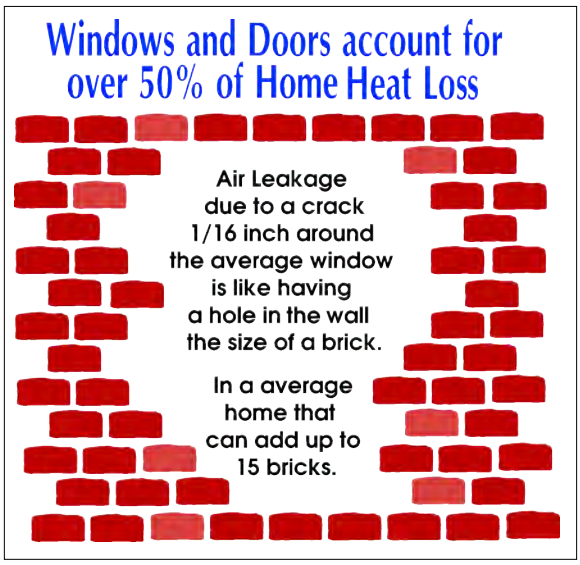
Individually, each reason is enough to use vinyl windows. If comfort and energy savings are most important to them, then changing their windows can make a big difference.



Infrared Photo shows Heat Escaping Out of Windows

Drafts, feeling "cold", condensation, and heat loss will make any home feel uncomfortable. In fact, statistics show that up to 50% of the heat loss in the average home can be through old, drafty windows.

• Heat loss conduction through the glass and frame of an old, inefficient window can lose the equivalent of a pint of oil, every day - for every window.



• Air infiltration due to a crack 1/16th inch around the average window frame is like having a hole in the wall the size of a brick. In an average home that can be a hole the size of 15 bricks, or leaving a window open 6 inches on the coldest day.

If old windows stick, or are hard to operate, maybe they just wore out. Old putty, rotted frames, cracked glass, poor fit, broken hardware, worn or missing weatherstripping, cracked glass, single pane glass, or poor storm windows can make the best windows old before their time.

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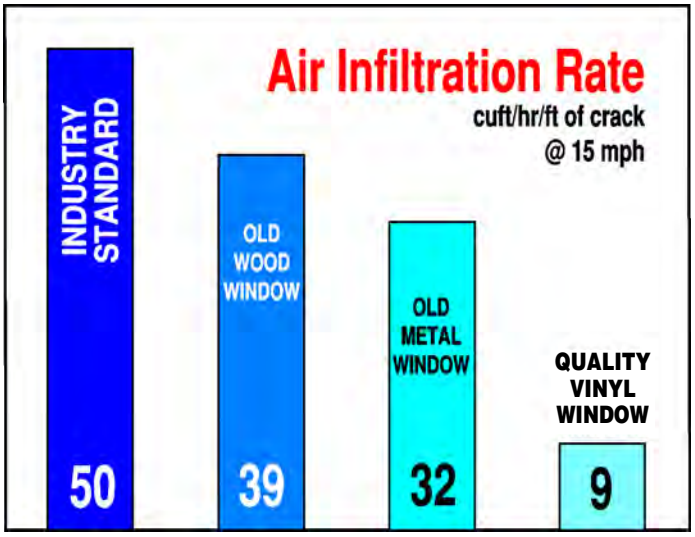
Trying to stave off the inevitable can take hours of caulking, repair painting, and frustration. In fact, most repair costs are greater than replacement costs in severely damaged windows.

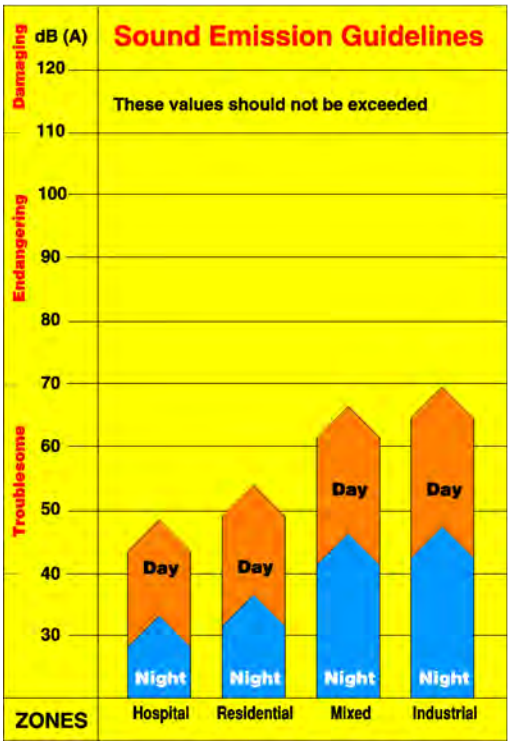
Replacing windows to improve appearance is a smart thing to do. Besides improving the value of your client's home, the replacement of windows and doors is the single biggest improvement they can make to their home because the benefits can be enjoyed inside, and outside their home - at the same time.

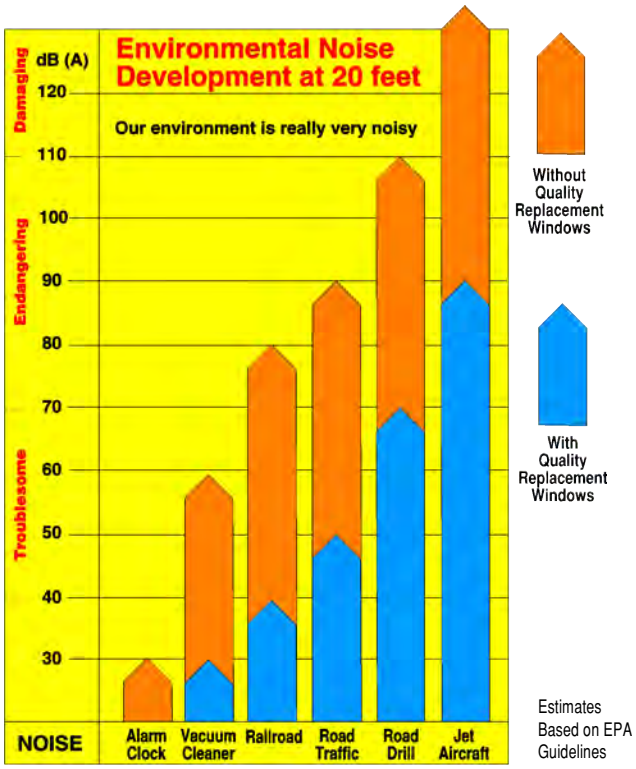
QUALITY VINYL WINDOWS REDUCE AIR INFILTRATION



Broken locks, and loose windows are invitations to break-in. Certainly no window is going to prevent an intruder, but statistics show that the more you slow down an intruder, the more you discourage him from trying. The locks and balance mechanisms of today's modern Vinyl Replacement Windows may be the deterrent that a homeowner needs.

The least spoken of advantage to new windows, but perhaps one of the kindest of all, is the sound transmission reduction a quality window offers over old windows. Quality Vinyl Replacement Windows can reduce interior noise levels up to 40 db which is the equivalent of silencing an alarm clock. This can be very important when living on a busy street, across from a commercial area, or near a busy street, highway, train station or airport.





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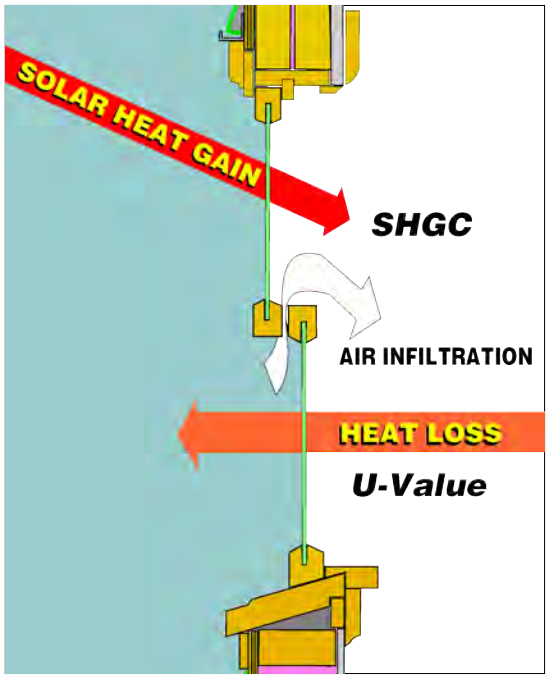
Measuring Window Efficiency

There is no such thing as “cold”. In fact, you could define”cold”as the absence of heat. In the wintertime, try to not have too much absence of heat, and in the summer we want as much “absence of heat” as we can get. Heat is dynamic. It tries to balance out everything. It moves towards cold by conduction, convection and radiation. It’s this movement of air towards cold (when near a window) that we often call “draft”.



Heat is measured in terms called BTU’s. A BTU (British Thermal Unit) is a measure of heat energy and is defined as the amount of heat needed to raise the temperature of one pound of water by one degree Fahrenheit.

A window’s resistance to heat flow is expressed as U-value which is the measure of resistance to heat transfer and is defined as the rate of heat loss, in BTU’s per hour, through a square foot of a surface (wall, roof, door, windows, etc.) when the difference between the air temperature on either side is 1˚ F or more. The U-value is the reciprocal of the R-Value. As you can see, the greater the difference between the air temperatures on either side is greater, or the area is greater, etc., the greater the potential heat loss. Of particular effect is the difference between the interior heat and the exterior cold.

The U-value of windows and doors is determined using a difference between indoor and outdoor air of 68˚F. If the temperature difference is less, then the U-Value is smaller, and the “insulation value” of the window appears to be improving. If the temperatures were the same, inside and out, no heat flow would occur making the window appear as if it were a perfect insulator. The ability to block heat transfer through the window is less important the warmer the climate gets. In practical terms, this is why U-value is more important the colder the winter is, and the more heating degree days a climate has.

The converse is also true. In warm seasons and warmer climates, heat gain from the sun (direct or radiant) is more important than the heat loss through the window. That’s when Solar Heat gain is a more important yard stick for window performance than U-value.

Solar Heat Gain (stated as a decimal between 0 and 1 with lower being better) has replaced Shading Coefficient as the major criteria for judging a window’s ability to block heat build up from the sun. SHGC is defined as the ratio of the solar heat gain entering the space through the window area to the incident solar radiation. Solar heat gain includes directly transmitted solar heat into the space, (hot car interior) and absorbed solar radiation, which is then re-radiated, conducted, or convected into the interior space (hot driveways, pavement, building walls, etc.).

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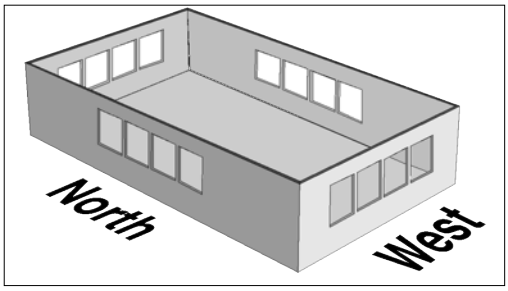
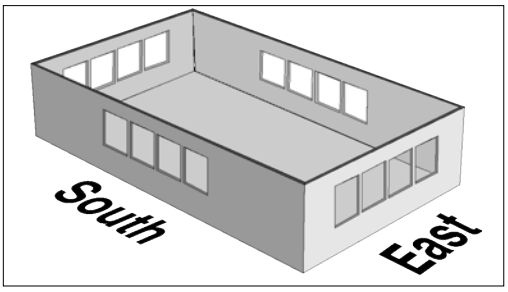
Window orientation.

It also matters on which side of the house the windows are placed. Windows on the southern side tend to have greater heat gain and less heat loss than windows on the north. Windows on the west side get stronger sun in the afternoon (near sunset) and are a less desirable orientation if cooling is a concern.



Different Climates affect Window Performance Depending on Which Side They are Installed.

In northern climates, having large windows face south and west are better than facing north and east. In southern climates, windows facing north and east are better than windows facing south and west.

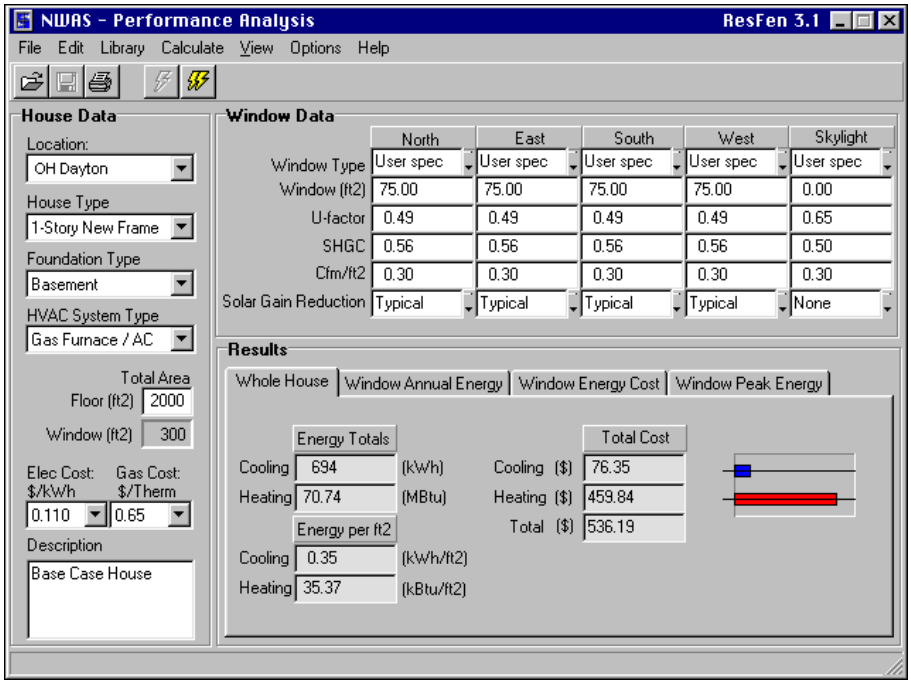


Using this knowledge, it is possible to "tune a home's energy efficiency" by using glazing systems matched to the side of the home where the windows will face. Better SHGC on the west and south, better U-value on the north and east.

Computer Analysis

Selecting windows requires technical skill due to the complicated and sophisticated engineering designed and built into quality vinyl windows.

It is possible to use computer analysis programs like ResFen (used by NWAS for their in-home analysis) developed by Lawrence Berkley Labs.



These analysis programs make it possible to accurately predict the performance of windows in a particular home in specific climates, and with specific placement in the home.

Each window is matched to the climate and the orientation in the home and the U-value and SHGC and air infiltration ratings are analyzed over the course of the climate year. It is the most complete, and accurate, evaluation of the recommended new windows versus the windows they are replacing.

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Replacement Windows are an Investment that Pays Dividends Immediately

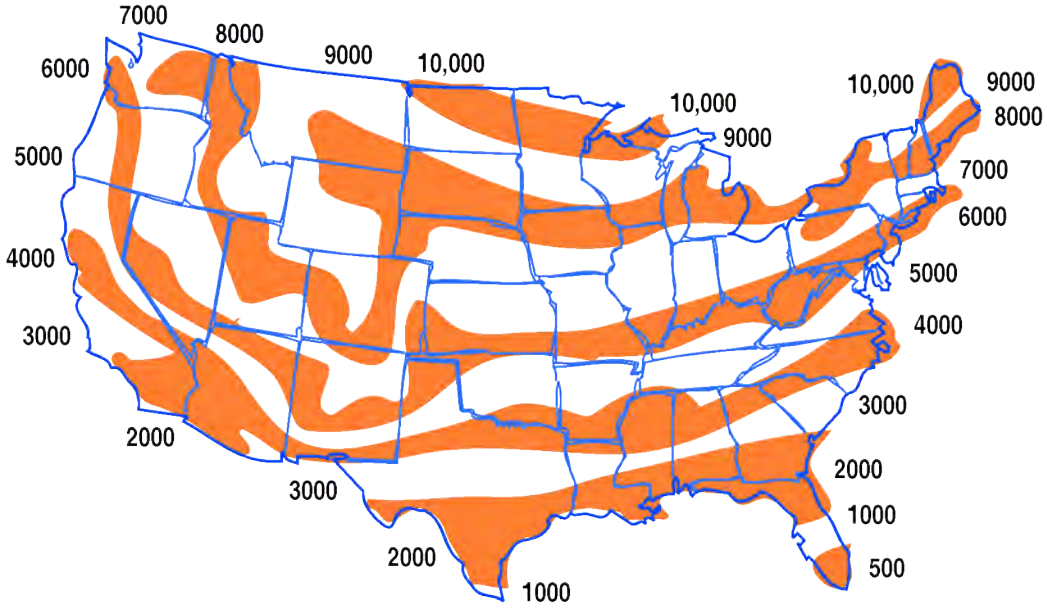
A lot has been written about the return on investment with new windows, and the energy savings alone can pay back the investment in a very short time.

The question always arises, "How much will I really save?" The following chart is a rough calculation that will at least give your customer an idea of the potential winter savings in terms of real dollars. Additional savings can be expected with "High Performance" glazings, reduced summer cooling costs, reduced carpet and furniture fading and reduced interior and exterior maintenance.

POTENTIAL WINTER ENERGY SAVINGS

I		II		III		IV		V
Number of Windows	X	Degree Days (HEATING)	X	**Heating Fuel Factor** .006 For Oil .007 For Gas .138 For Electric	X	**Cost Of Fuel** (Per Ga. or CuFt. or KWH)	=	**Potential Annual Savings**

HEATING DEGREE DAYS



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