

Foreword by
Sal Alfano
Editorial Director
REMODELING Magazine



**WHY...Buy
Replacement
Windows?**
(Not for Dummies!)

By Dave Yoho

Acknowledgements

With deep appreciation to all those who participated in the research and the many stages which precede the publication of this book.

To the associations, government agencies and information sources, the Better Business Bureau, and the numerous manufacturers as well as those individuals involved in manufacturing research and those who market and sell replacement windows who granted us interviews, we give a deep bow and say – **thank you – thank you.**

To Brad and Brian, two of our executive managers, who developed the concept, created the network and worked with the numerous technically related sources, it is more than a **thank you**. Because of their awareness, creativity and diligence, we are able to provide this “first-of-a-kind” informational source for consumers.

Moreover, to you the reader, we acknowledge your importance in desiring to have and utilize this information.

Dave Yoho, President
Dave Yoho Associates
dave@daveyoho.com

About the Author

Dave Yoho: Presides over one of the oldest and most successful consulting groups in the US – He sits on the board of public companies, has appeared in over 100 video training series and has made over 5,000 speeches in 50 states and in 18 foreign countries.

His first job after graduating from Temple University was as a trainee in a company which soon became a division of Reynolds Aluminum. Here was the ignition that lit Dave's interest in building materials and home improvement products. By age 25, he was a part of its Executive Management team and left before his 30th birthday to found his own business.

The majority of Dave's adult life has been devoted to understanding the needs of others and how to convey messages which would benefit both readers and listeners. He has authored numerous articles on the benefits of various products and services offered to improve homes. He has been a consultant to many companies and management groups who are developing or improving products and services for the building materials industry.

Dave Yoho has designed communication systems used by Fortune 500 companies as well as small entrepreneurial organizations. In 1991, he wrote his first best selling book: How to Have a Good Year Every Year (Berkeley Press) which was circulated internationally in five languages. In 2005, his sequel, Have a Great Year Every Year was published and again became a best seller.

During his career, Dave Yoho has long been a champion of and platformer for consumer protection regulations. He has testified before state and federal legislative groups and his advice has been solicited in numerous cases for contractor licensing regulations.

Now he has been selected to research, develop and write this book: *Why... Buy Replacement Windows? (Not for Dummies)*. It is hoped that you, the reader, will benefit from his research.

Additional biographical information is available via his website:

www.daveyoho.com

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Introduction

by Sal Alfano - Editorial Director of Remodeling, Replacement Contractor and Upscale Remodeling Magazine

If you're like most people, your home is your largest investment. In addition to what you paid when you purchased it, you've invested time and money in upkeep and maintenance to protect that investment.

The fact that most Americans take great pride in how well they maintain their home is the main reason that home improvement expenditures in the United States now stand in excess of \$300 billion annually. As the editorial director of several magazines aimed at professional remodeling and home improvement contractors, I have the inside track on first-hand information about many of the products and services that homeowners purchase to keep their homes up to date while also reducing the cost of maintenance.

One of my publications, Remodeling Magazine, produces an annual survey entitled **"The Cost vs. Value Report"** which compares the construction cost of many popular home improvement projects to the amount which they contribute to resale value. The portion of the report dedicated to replacement windows is included in this book.

Dave Yoho, the author of this book, is a recognized expert within the home improvement industry. In addition to his many accomplishments, he at one time owned and operated what was the largest home improvement company in the United States. The companies who originally developed and promoted the replacement window sought from Dave and his company the advice and direction which enabled the replacement window to become an industry in and of itself.

Since that time, replacement window projects have become a high priority for most American homeowners. In 2007, more than 33 million replacement windows were

manufactured for use in residential housing. This figure represents 50% more windows than were manufactured for new construction in residential housing.

This book represents knowledgeable research applied in a way that enables homeowners to read and understand why replacement windows are a key ingredient for energy management and ecological balance. I think you will find that Dave Yoho's personal experience and expertise enables him to deliver information that is invaluable to all homeowners. The information found in chapters 5 (*"Who Should Install the Replacement Window?"*) and 6 (*"How to Select a Replacement Window Contractor"*), are particularly helpful.

While I may be a representative of the home improvement industry, I am also a homeowner. Do yourself a favor and read this book more than once. Learn as much as you can about replacement windows. The resulting value will startle you.

(This book is also available in an audio format that can be easily downloaded - or - it is available on CD.)

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Chapter 1: You live in a house – so you inherited windows

“Windows can be one of your home’s most attractive features. Windows provide views, daylighting, ventilation and solar heating in the winter.”

- - Department of Energy

When you bought or built your home did you actually count the number of windows in your house or calculate how many square feet of glass your house is composed of?

Your windows may be double hung, casement, sliders, fixed lite (and there’s more). The glass may be single pane, or multi-paned. They may have frames made of wood, metal, vinyl, fiberglass or composite materials. They may have obsolete hardware and outdated balances (they’re the things that help the window go up and down).

If you’re like the majority of homeowners, you liked the general design of your home, the layout of the rooms and its proximity to schools, places of worship and shopping. Much of the other “stuff”, including the windows, was something you took for granted.

I have spent most of my adult life in and around the construction industry, as well as home remodeling and home improvement. Despite this, I am - like you - a homeowner. Much of what I will write about in this book is biased because of that fact. I have sat through hundreds of presentations for new products and new manufacturing methods. I have been privileged to know and work with many of the pioneers who created, manufactured and marketed windows of all kinds. However, this book is being written to and for homeowners who are fairly similar to myself.

The concept of glass in the walls of your home is a given. Yet, the fact that glass has existed as a method for transmitting light and visage for hundreds of years has been of little importance to most homeowners. In the last 30 years the advancements in the production of glass as well as the many options available have been a great benefit to our society in general and homeowners in particular.

As you read this book, remember that our goal is to aid you when the time comes to replace your windows, and also to give you a better understanding of the kind of replacement windows and glass packages which will have the most beneficial effect on your lifestyle and your budget. In chapters 5 and 6 we will examine in detail the best methods to install replacement windows and how to select a replacement window contractor.

First, let us examine some history to better understand the original intent of a window vs. the needs of homeowners today. Most wordsmiths agree that the word window is Scandinavian in its origin and is a conjunction of several words which are interpreted as "the eye of the wind" or "wind's eye".

Unquestionably, those ancient Norsemen were motivated by the fact that the word "home", literally translated, was a place where people lived. They cooked in and heated the interior of their homes by whatever methods were available at the time. Most of these were enclosures that provided no ventilation or opening for visage - and so the absence "of" created the need "for."

In all probability the original openings were installed high on the building and maybe even in the roof. We speculate that this opening being high up in the enclosure offered a view of the sky (thus the part of the word meaning eye). Probably because Norwegian winters consist of low temperature and howling winds, the name "wind's eye" seemed appropriate. Later, in typical fashion, we would create the English word based on this translation: window.

So, how many windows do you have in your home? And how many square feet of glass do you have in your entire house? In truth, homeowners love the idea of being able to look out and allow daylight in, giving light to the interior of their homes without throwing a light switch.

We also like to decorate around our windows, both inside and out. We have specialists who design "blinds" in shaded colors to fit our interior design. We spend many dollars on drapes which can be drawn to give us privacy at night and add décor to our interiors. We place shutters to the sides of our windows with no intention of ever closing them (which was the original intent – to shut out wind and rain). And we certainly don't wish to complicate our lives by counting the square feet of glass.

We love our windows - and as ceilings got higher and houses in general got more expansive, we took for granted that more and more windows were natural. "So what?"

Here is the challenge we face with our homes today. Most modern houses were built with 1 opening per 100 square feet of exterior wall space. If the average window in a home is 6 feet high by 3 feet wide, that equals 18 square feet within the 100 square feet. While discounting the area for the frames, but allowing for the glass, this might mean that as high as 15% of the exterior wall area of a house is glass, which represents the most vulnerable part of the walls and the insulation system of your home.

The Department of Energy (<http://www.doe.gov>) has produced numerous studies relating to this vulnerability. Think of it this way: your home loses or gains heat through its windows. The walls, floors and ceilings of a home may be well insulated and meet the best "R Factor"* standards. Despite this, the glass in a window can radiate the heat manufactured inside the home to the outside in the winter. In the summer or in deep southern or western climates, the issue changes and the outside heat tends to penetrate glass, thus reducing the effectiveness of an air conditioning

system. In these climates, this factor is referred to as a solar heat gain coefficient (SHGC). It refers to the fraction of solar radiation passing through the window as heat compared to the amount of solar radiation striking the window. This latter rating, together with the (R) and the (U) factor** can be specified when someone is replacing their windows. Many older homes have windows with single panes or double panes without special heat-saving coatings. This condition, coupled with loose or aging frames around the window will contribute to excessive heat loss or gain.

** The (R) Factor – the resistance to heat flow or the degree to which a material resists heat transfer. The higher the R-Value, the better the insulating performance.*

*** The (U) Factor – the measurement of how much heat is transferred through a window. A lower U Factor represents better insulation and less heat flow.*

When and if you decide to have your windows replaced, this information will be beneficial. In chapter 6, we will describe how to include this in the specifications as a part of your contract.

The Department of Energy estimates that 20+% of heat loss or gain may be due to radiation which comes through poorly or non-insulated glass. It is not uncommon for apparently well-built homes to have windows that measure a high (U) Factor (which is undesirable). To reinforce this point, here is a direct quote from a Department of Energy publication:

“Windows can be one of your home’s most attractive features. Windows provide views, daylighting, ventilation and solar heating in the winter.

Unfortunately, they can also account for 10% to 25% of your heating bill. *During the summer, sunny windows make your air conditioner work two to three times harder. If you live in the Sun Belt, look into new solar control*

spectrally selective windows, which can cut the cooling load by more than half." ("Energy Savers: Tips on Saving Energy and Money at the Home", a Department of Energy publication. <http://www.energysavers.gov>)

The Department of Energy publications are replete with advice on how to reduce the cost of energy in your home, a major factor of which relates to inefficient windows. If you check your windows now and find the glass is single pane, you probably would have been wise to replace them sometime ago. You may have already paid for replacement windows if you have lived in this house for seven to ten years.

If you are reading this book on a day when the temperature is cold outside and your heating system is working at making you warm and toasty try this experiment: While inside your house, simply place the palm of your hand on an outside wall, not too far from your window. Then, place it on the glass in the nearby window. Then ask yourself - what is causing the difference in temperature?

Next, with some caution (be sure your drapes are out of the way), while standing in front of the same window, light a match or lighter and hold it approximately 1 inch away from the pane of glass. You will notice that the flame is attracted to the glass and will constantly bend in that direction. This experiment shows how the heat being manufactured in this small light is being radiated through the glass. Now think of a hundred or even a thousand of these little flames being held in front of this same window and you may perceive the concept of heat loss.

There are other tell-tale signs which indicate whether the efficiency of your windows is currently in good standing. Take the following steps on your own to see if you're a candidate for a complete window inspection.

Start by opening each window. If it is a conventional double-hung (the lower sash lifts up and the upper sash can be pulled down) check how easily it works and remember as you do, in the event of an emergency such as a fire, you might be

forced to exit your house by this route. Some of your windows may, when unlocked, slide side-to-side (they're called sliders). And some of your windows may crank in and out with a handle at the lower part of the window (most of these are casements). These actions alone will make you aware of conditions you may never have thought of.

Occasionally, your windows may be difficult to move because the connections between your sash (the part that holds the glass) and the frame (the part that surrounds the window) have been over-painted, which will cause them to stick when you attempt to open them.

After reading this chapter, don't be upset with the builder, the manufacturer of the windows, or the person who installed them if you live in a relatively new home with windows in poor condition. Chances are that when you previewed this house before you bought it, you gave extra attention to the kitchen and the bathroom. Realtors tell us these are the two main attractions (rooms) for prospective buyers. So, don't berate yourself either, because you did not check out the windows when you purchased your home (this is normal). Do remember, **you live in a house – so you inherited windows** – so it is wise to take care of that which you have inherited from here on out.

In the next chapter we will delve further into the benefits of replacement windows while also providing a few case histories as we attempt to answer the question - who needs replacement windows?

Chapter 2: Who needs replacement windows – and why?

“When you are shopping for windows remember they provide much more than light and air. Windows can set the tone for a room and are a significant design element in your home.”

- - George Faerber

As its name implies, a replacement window is manufactured with upgraded features which more aptly respond to the needs of your home. To put this into perspective, here are some case studies which grew out of the research for this book:

George and Carla Zimmerman live in a home that he inherited from his parents. The home, which was built in 1957, had its original windows until recently. Located in upstate Pennsylvania, they experience frigid winters while living in a house heated by residential heating oil. Their costs have risen dramatically over the years. Despite the fact that their heating bills kept getting larger, they never thought about the windows being a contributing factor. A few years ago, their utility company provided a free energy inspection, the outcome of which had a dramatic effect on them.

The inspection report indicated that their single pane windows were probably contributing to almost 23% of their total heat loss. When they added the cost of painting their wooden windows every 4 years, they found they could recover the cost of replacing their windows in about 7 to 9 years. Theirs is not an isolated case and is representative of most homes of that era (40 years or older).

So what about newer homes?

Earl and Millie Mielke lived in a home that was less than 20 years old. In northern Virginia (a Washington D.C. suburb) homes sell for \$600,000 to \$800,000 on average, and theirs was exceptionally well maintained. When they decided to retire, their home went on the market and was sold - subject to a home inspection

requested for the buyer. The home inspector noted that the windows had “issues” which required that the majority of them would have to be replaced shortly. This was inserted as a contingency in the contract for the sale of their home.

What about even newer homes?

Paul and Donna Clausen bought a new home less than ten years ago in a suburb of Columbus, Ohio. When the home was 8½ years old, they noticed that several of the windows appeared to be “fogging”. Although their home was beyond warranty, the builder was kind enough to visit their home and advise them that the fogging was purely a cosmetic issue. Later, they had a home inspection company examine the windows only to find that the cause of the fogging was due to the deterioration of the seals between the two panes of glass in what was supposedly a quality insulated window. They had the windows replaced in their home slightly over 9 years from the day they had acquired it.

From these three case histories we draw the following conclusions:

First, houses that were built in 1957 had to use windows that were available at that time. Improved glass packages which include special coatings, sealants and bonding processes were not a consideration until almost 20 years later. If your house fits this category and the utility company serving your community or a similar service offers “energy loss” inspections, consider having this done.

In the second case, why wait until you put your house on the market to have a thorough inspection of your windows? Home inspectors can evaluate your windows at any time, not just when your house is being sold. In addition, many companies who market replacement windows provide a similar inspection service.

The third issue is that even if you live in a newer home, don't assume that the windows which were installed by the builder are of a quality which will get you

through the next 20 years - and even if they do, they may become a financial burden.

In our research for this topic, we contacted the National Association of Home Inspectors, Inc. (<http://www.nahi.org>). We spoke to Mallory Anderson, Executive Director, who provided us with abundant information regarding the inspection of windows. Her organization, in turn, relies on abundant information provided by others who have researched this topic. Today we are of the opinion that in many cases, it would be wise for those homeowners who are unsure of the status of any portion of their home, but particularly their windows, to arrange for an inspection.

We ran into numerous cases where a home inspection played a formidable role in unearthing circumstances that either required immediate attention or stood as an impediment to the sale of a home. In each of the previous case histories, this was apparent. We also ran into numerous cases where issues which were discovered by the home inspector turned into situations requiring contingency clauses in a purchasing contract or outright deal-killers.

The issue of fogging in a dual pane window came up frequently. This fogging indicates that the thermopane window has lost its seal, thus impairing its energy efficiency. Looking again at the third case history: Even when the inspector's report indicated that only several windows had the "fogging" condition, the potential buyer (or their advisor) felt that this indicated that the balance of the windows in the house might soon fail, thus requiring expenditures of several thousand dollars in repairs.

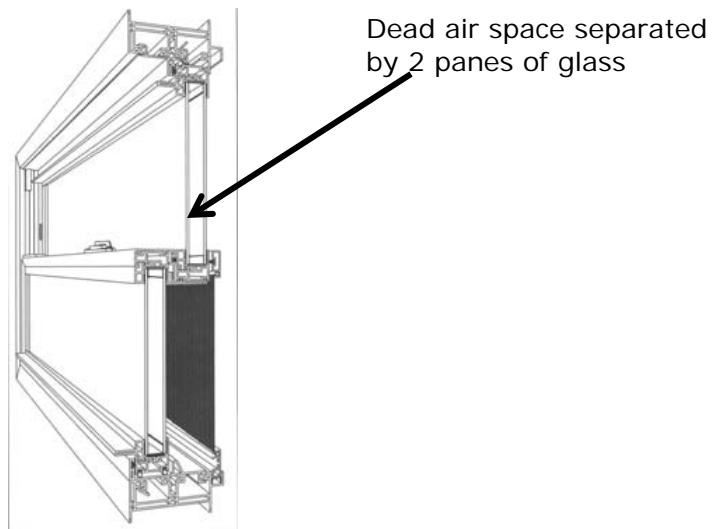
It is even more confounding that in many cases, homeowners are not aware that fogging represents a deficiency. In their defense, the concept is not easy to wrap your head around.

Ask yourself this question: "If you lived in a home featuring thermopane glazing (i.e. two panes of glass separated by dead air space) which require "spacers" that hold

the glass panes apart and special seals which prevent leakage into the dead air space - why would you be experiencing fogging?" The answer is: the quality of the spacers and the sealants connecting the spacers to the windows most frequently determine whether there will be a premature failure in the "seal". This is clearly not an answer that the average person would expect **(See Illustration A)**.

Even the presence or lack of glass coatings (Low-E*) can be detected and cast doubt on the buy-sell transaction.

Illustration A



(Courtesy of Thermal Industries)

Other issues raised by home inspectors related to the hardware of the window. If you have casement windows that crank in and out, there can often be a failure in the gear mechanism or the small crank. These quality impairments, when detected by a home inspector, often lead to deal-breaking or renegotiating.

Since the end of World War II, there have been over 1 million new homes built annually. As our economy grew and the desire for larger and more spacious homes increased we developed houses with a greater quantity of larger windows. As a natural consequence, more square feet of glass was developed, leading to increased vulnerability. Modern technology has produced a higher quality window

with many glass options, but that does not mean the person who was responsible for having your original windows installed understood or took advantage of all these options.

Rich Gillman, President of a second-generation window manufacturing company (Republic Windows & Doors) who manufactures windows for both the new construction and the remodeling industry, has done some serious analysis as to why these circumstances occur. He believes that less than 50% of the builders utilize Low-E coatings in the homes they build. Builders, in turn, say that most owners do not request Low-E coatings for the windows in their new home. So we ponder, is it because the Low-E coating is presented as a costly option – or is the home buyer poorly informed about the value of Low-E? In any case, it is an option too easily overlooked (more on this later).

** Low-E (low-emittance) coating – a virtually clear material which utilizes a silver base and is applied to the glass in the manufacturing of the window to cut the transmission of ultra-violet rays that pass from the outside to the inside.*

The prevailing wisdom is that most replacement windows today should include Low-E treatment. Most companies also offer the option of argon gas*, which is inserted between dual panes for increased efficiency. When homeowners buy windows without Low-E coating, the lack of this additional insulation protection can place a great strain on the heating and air conditioning system in a home and require its early replacement. In addition, given the rising energy costs, without properly insulated windows the added cost of maintaining this home over the next 10 to 12 years would pretty much equal the cost of a new set of windows. In short, Low-E coatings and argon gas together with the proper frame to contain the gas package will significantly reduce heat loss and heat gain.

** Argon gas – an inert gas which is sealed between the panes of glass during the manufacturing of the window, replacing the air which would*

normally inhabit the space. The gas creates an improved insulator which increases the thermal value of a window.

Wayne Gorell, President of Gorell Enterprises, also a second-generation window manufacturer, concurs with these findings. He went on to stress that these Low-E coatings should not be compared to tints or films* (an earlier technique) which frequently diminished visible light but did not seriously affect ultra-violet (UV) penetration. He also stressed that in certain sections of the country, where there is high-intensity UV concentration, homeowners experience fading of their carpeting, drapery and furniture. This exposure is severely reduced with the use of Low-E coatings.

** Tints or films - Earlier methods attempting to reduce UV light included the attachment of a darker film to the glass. This is a process similar to what you see occasionally in automobile glass windows which intend to create privacy.*

Wayne also stressed that the decision to replace outmoded windows with those which include the proper insular value lead to greater comfort for the owners. As an example, window temperatures are more moderate and the discomfort from strong summer sunlight is reduced.

Rick Mendola, a General Manager of Park Avenue Windows, stated that the high cost of maintaining a home along with increased energy costs are a result of many homeowners not being aware that they are already paying for what it would cost them to replace their windows. He likened it to the old Fram commercial (a replacement auto part) which stated: "You can pay me now or you can pay me later".

Note: *In chapter 8 of this book, we will provide you with the cost vs. value analysis that indicates what part of the investment is*

recovered as an aftermath of the installation of replacement windows.

Most homeowners love their creature comforts. As a society, we went from post World War II when few houses had garages - to the 2 or 3 garage home of today. We found greater ways to enjoy the outdoors, with patios, decks and even swimming pools. We learned that we could enjoy the great outdoors occasionally by simply looking out of our windows.

Along the way, modern home builders discovered the attraction for picture windows, which in turn created a greater way to view the outdoors, while presenting an even greater decorating opportunity for the interior of the house. Homeowners love their picture windows. They are frequently installed with one large single pane window in the center and a double hung or casement window on either side (**See illustration B**). This creates 80 to 100 square feet or more of vulnerability. Without replacement, the heat loss (or gain) might be compared to having an overhead garage door in your front wall and leaving it open.

This is unquestionably a luxury which must be managed.

Illustration B



(Picture Window Courtesy of Thermal Line Windows)

Despite all that you have read so far, American homes are great. We have learned how to live with more space and many of the options such as high ceilings and big windows, great lawns and landscaping, and innumerable appliances (and more) have added value to our homes. Now it's time for everyone to consider how to manage all of these luxuries.

Taking care of the windows in our home is a major ingredient towards maintaining our comfort while also managing our budget. As we move through the following chapters, I hope you will extract the information and act on it to better manage your windows.

Next, we will briefly cover the history of replacement windows to spotlight how far the industry has come.

NOTE: Various government agencies, research groups and associations provided information on the many issues in this book which are made available to homeowners. You are encouraged to review their data.

1. Department of Energy (<http://www.doe.gov>)
2. The US Environmental Protection Agency - check out their Energy Star Program at (<http://www.energystar.gov>)
3. National Fenestration Rating Council (<http://www.nfrc.org>)
4. The Window & Door Manufacturers Association (<http://www.wdma.com>)
5. The American Architectural Manufacturers Association - AAMA – (<http://www.aamanet.org>)

Chapter 3: A replacement window - not your average window

“As energy and maintenance costs soared, the invention of the replacement window came as a product of necessity.”

- - Wayne Gorell

A replacement window is specifically engineered and built to replace the existing window you now have. A replacement window is manufactured and installed to cure the inequities of the existing window and to reduce heat gain or loss. It may contain special coatings and argon gas, special reinforcements for the frame which holds the glass and special hardware which may include security locks. The window can be manufactured to imitate in appearance the window it replaces or it can add a more modern appearance.

It was not always this way. **Charles L. Smith**, CEO of Thermal Line Windows was a schoolboy when his father joined a group of pioneering storm window dealers to promote the concept of replacing windows rather than attaching storm windows to them. In 1961, Howard Ettling, the owner of a company called Weatherseal, produced and sold what was purported to be the first replacement window. He introduced his products to storm window installation companies. As his company grew in size, the name was changed to Nu-Sash.

In 1968, according to Mr. Smith, Nu-Sash was sold to Georgia Pacific. Continuing industry research brought about the development of vinyl replacement windows which were a major leap forward in that they obviated the need to paint the wooden frames. The most advanced style window was manufactured and introduced by Season all Industries of Indiana, Pennsylvania in 1972. The window included 1-inch, double-paned, insulated glass. When the window was introduced, the majority of the larger Nu-Sash dealers began to sell this product under the name Thermal Gard.

The replacement window of today is a far cry from the earlier models. Research as to the needs of homeowners created new and better products. Today, the replacement window is manufactured with options for different seasons and geographic needs. The industry has grown in sophistication and has developed methods by which to examine the efficiency of these window products. As an example, the National Fenestration Rating Council (**NFRC**) (<http://www.nfrc.org>) developed a recognized rating system based on studies surrounding the product performance of these windows.

The **NFRC Rating System** enables purchasers of replacement windows to determine the energy efficient properties of the windows they are contemplating. The **NFRC** label, together with its rating format, appears on all replacement windows which are part of the **Energy Star** program.

The Department of Energy together with the Environmental Protection Agency have developed an outstanding program that is internationally recognized called **Energy Star** (<http://www.energystar.gov>). Products bearing this label are required to meet special criteria and standards. The Energy Star program takes into consideration the various climates (for designated climate zones) and conditions that might affect the performance of the window.

The replacement window of today takes into consideration the many and variable conditions under which the window will have to operate. We have already discussed (R) and (U) Factors as well the solar heat gain coefficient. Remember, this is the fraction of solar radiation passing through the window as heat compared to the amount of solar radiation striking the window. Depending upon where you live and under what conditions the window will operate, it is important to ask about this when considering the windows you will have replaced in your home.

When it comes to understanding the glass (glazing) in your window, here is a non-technical explanation on what to look for. First, understand that only about half of the sun's energy is in a form that is visible to the human eye. The rest only

contributes heat to the inside of your home. So you want a glazing that maximizes the amount of light entering your home while still minimizing energy use. And here is the simple rule that goes with this maxim: Double-pane windows with E-Coating and argon gas (or similar) offer better insulation qualities and reduce cooling loads.

If you're in the state of Arizona you want a window that transmits as much of the sun's visible light as possible while rejecting as much heat as possible. In an earlier chapter, we alluded to large picture windows, so remember - the larger the window the more need there is for efficient insulation. This may sound confusing, so remember to consult the **Energy Star** ratings for more clarity.

Again, quoting **Charles L. Smith**, "The further south you are located, the more shading you want from your windows. The farther north you are, the less shading you need." Having a manufacturer who combines the right amount of Low-E coating, the right gas and the proper coefficient for shading will make all the difference."

Wayne Gorell brings up another point, "First be sure you examine the balancing system on a double hung window. This is the mechanism that permits you to move the window up and down easily." Wayne points out that the well-designed, well-made window always incorporates a well-balanced system.

At the risk of being repetitious, I want to reinforce some of the information already provided with these reminders: The Department of Energy includes these tips on their Energy Savers website (<http://www.energysavers.gov>).

- When you're shopping for new windows, look for the **National Fenestration Rating Council** label; it means the window's performance is certified.
- Remember, the lower the U-value, the better the insulation. In colder climates, a U-value of 0.35 or below is recommended. These windows have at least

double glazing and a low-e coating.

- In warm climates, where summertime heat gain is the main concern, look for windows with double glazing and spectrally selective coatings that reduce heat gain.
- Select windows with air leakage ratings of 0.3 cubic feet per minute or less.
- In temperate climates with both heating and cooling seasons, select windows with both low U-values and low solar gain co-efficiency (SHGC) to maximize energy benefits.
- Remember that new windows must be installed correctly to avoid air leaks around the frame. Look for a reputable, qualified installer.

Once selected, the replacement window will be manufactured to enable an ease of installation which minimizes the interruption to the lifestyle of those living in the house. Most replacement window installers are specifically trained and equipped to work in existing homes replete with people, furniture, wall-hangings and similar. In chapters 5 and 6, we explain this in greater detail.

A replacement window contractor will measure your windows - sometimes more than once - then detail the conditions inside and outside to determine how best the replacement window is to be installed (more on this later). The windows are then custom-built for the specific opening of the window to be replaced - - with adjustments for conditions relevant to the installation. Replacement windows come in various styles and sizes, with all kinds of options.

Quality replacement windows have an ease of operation and because of modern and unique raw materials, they can be virtually maintenance free.

In the next chapter, we will outline the savings benefits of replacement windows in order to show that they are in most cases not an expense but an investment.

Chapter 4: Are replacement windows an expense - or an investment?

“Many home improvement projects represent a ‘want’ – while projects such as a leaking roof, a faulty heating and air conditioning system or replacement windows represent a ‘need’.”

- - Gary Delman

Research indicates that in most cases, replacing conventional windows with high performance replacement windows is an investment and wise investments usually pay a return. This belief is shared by many industry experts.

To evaluate the investment quality, let's start out by examining the cost of maintaining the windows already in your home. Review your utility bills, giving particular attention to the cost of heating and air conditioning.

In an earlier chapter, we made reference to a statement from The Department of Energy (<http://www.energysavers.gov>) in reference to windows. It states, “They can account for 10% to 25% of your heating bill.” The 15% difference is a product of the age of your house, where you reside geographically, whether you have single or multiple pane glazing, the tightness/looseness of the surrounding frames, and whether sealants are present and still performing their function.

Let's say that heating and cooling your home represents 20% of your utility costs. Take the below steps to estimate your return on investment for replacing your home's windows:

- 1. 20% of your average heating/air conditioning bill is \$X.**
- 2. Multiply this number by 12 to calculate your costs for one year.**

3. Next multiply the annual cost by 7 to 10 years.

Are you getting the idea that maintaining the windows you have may be costly and that replacement windows are a rather good investment? Keep in mind that it is almost impossible to eliminate all heat loss or gain; however, if you could eliminate a high percentage of these costs, you will be getting a great return on your investment.

For many of you, there's more. If you have wooden frames on the exterior of your window, estimate what it costs to paint these frames once every 3 or 4 years. Depending on where you live and the availability of the painter it may cost as high as \$50 to \$70 to paint the outside of one of your window frames.

Most replacement contractors will cover or cap these frames with a surface that no longer requires painting. Even if you live in a home with a substantially maintenance-free exterior (brick, stone and many synthetic sidings) you still may have wooden frames around your windows and these add to the cost of maintenance.

Many window replacement specialists working with a formula called H.E.L.P. (Home Energy Loss Prevention) can make an on-site energy audit of the windows in your home. The survey will give you a fairly accurate idea of your investment recovery period. Many manufacturers have a formula for guaranteeing savings if all the windows in the home are replaced at one time (more on this in a later chapter).

Art Poland, a Vice President of Thermal Industries which manufactures both new and replacement windows says, "With today's high performance window technology, any homeowner can have a proven solution to resisting the sun's heat in the summer and welcoming the same heat in the winter." Mr. Poland went on to say, "There are energy efficient windows on the market today that are engineered to accommodate almost any budget while providing the highest levels of year-round comfort and energy savings - making them well-suited for virtually any climate."

He also emphasized that these high performance windows are “green”, a phrase which indicates that the product meets most of the standards for valuing and protecting our ecology. They are green, because they use technology that will help lower your energy use. This in turn reduces air pollution such as CO₂ thereby making a greener environment for everyone.

Face it, for most of us, our home is our largest single investment. Replacing windows is academic. You either protect your investment, or it depreciates and makes the home less valuable when you resell it. The added benefit is that while you’re living in the house, the cost of maintaining your windows is reduced dramatically.

Remodeling Magazine conducts an annual unbiased survey which is based on a study of how this investment may also affect the ultimate resale of a home. The data is segmented by geography and issues of weather, etc. (*see chapter 8*) Prior to the publication of this book, we surveyed numerous manufacturers and a few dozen homeowners to verify the veracity of this survey. The majority of the homeowners interviewed were in complete agreement with the survey as it reflected on their original investment and the ultimate return.

Rich Gillman, (Republic Windows), while not disagreeing with the survey, added: “The survey is done on numerous remodeling and home improvement projects.” He argues that all home improvement projects are not valued equally. He makes the point that, “The return on investment is apparent when you acquire a more efficient and glamorous kitchen or bath which in turn, makes it more readily salable. In the case of replacement windows, the benefits are not as easily visible to the human eye; however, the ongoing investment returns due to energy saving and maintenance are far in advance of these other projects.” He went on to say, “Most home improvement projects upgrade the value of a home, yet the rapid return on investment is not a benefit until the house is sold, whereas the replacement window usually starts to pay immediate dividends.”

Installing the proper window in the proper way will provide a return on the monies spent (return on investment). The Department of Energy states the issue in this manner: "Installing new high performance windows will improve your home's energy performance. While it may take years for new windows to pay off in energy savings, the benefits of added comfort and improved aesthetics as well as functionality usually make the investment well worth it."

In an extreme climate such as the northeast or upper Midwest (in the winter) the need for energy conservation is a no-brainer. This is equally true for many areas of the country where weather was once considered a moderate factor. The high cost of energy changed this thinking rapidly.

The same holds true for sections of the country which experience extreme heat. Studies show that in addition to energy losses attributed to excessive heat gain, the issue of how the excessive gains can lead to the early deterioration of a heating and air conditioning system adds a priority to the project.

Those living in the state of Arizona may be aware of the intensive studies that were done to help effectuate wise energy management. Sophisticated marketers of replacement windows have conducted their own studies. Jim Weisman, an engineering oriented replacement window expert from Arizona, even promotes a theory of "solar tuning" whereby he offers multiple glass packages (up to four), utilizing the most efficient (slightly more expensive) glass package for those houses where the most radical heat gain is concentrated on one particular side. For example, on the south side, which may receive intense heat via the sun the entire day, the most efficient package is offered. Then, on the other sides of the house, less expensive glass packages are offered.

Over the past decade or so, the importance of replacing outdated windows has drawn the attention of the real estate industry. Many realtors utilize the Hanley Wood "**Cost vs. Value**" survey which indicates the return many homeowners

receive (*see chapter 8*) from their investment in replacement windows when their home is sold.

When you replace your windows, keep all of the documentation, including any warranties in a separate file to support the value of this home improvement project as it relates to the price you are asking for your home. Log your savings on a before-and-after chart using your utility bills as a support. The real estate industry recognizes the value of replacement windows. In the event that your warranty is transferable (to the new owners), provide this information as well so the realtor may list this as an additional benefit for buyers acquiring your home.

For many years General Electric recognized the value of providing assistance for those who were making major improvements in their home through GE's Home Improvement Sales Finance Division. **Bruce Christensen**, a Vice President of that division (GE Money) stated, "Replacing and upgrading windows is one of the most valuable improvements a homeowner can make, usually returning more than 80% of the cost. In addition to improving safety, efficiency and maintenance, new windows or doors enhance the beauty and comfort of a home."

A homeowner might want to replace and upgrade all of their windows at one time, but might not have it in their budget. Most financial institutions provide programs which enable homeowners to have installment and flexible revolving terms that can transform lump-sum costs into manageable monthly payments. Frequently this enables homeowners to have all their windows installed at one time and yet, not tie up their other credit lines used to fulfill day-to-day needs.

Most reputable lending institutions offer various credit options for consumers to choose from that best meet their budgeting and financing needs. Frequently, the cost of maintaining the loan (interest) is offset by the cost-savings from the replacement window project.

Bruce Christensen suggests that anyone who even anticipates some future lending arrangement should, "Get a copy of your credit report so you are aware of what lenders will see. There are a number of online services that can provide this at no cost. Errors or inaccurate negative information can impact your ability to get credit and/or affect your interest rate." He also suggests that you "Compare current finance rates being offered by contacting various banks, credit unions and lenders. Understand the product offerings and restrictions that may apply to the most attractive rates and terms."

GE Money, like many other reputable lending institutions, has an interest in the customer satisfaction rating of the financed project. Most institutions require that the home improvement service provider qualify for the right to represent their line of service. These institutions have standards for the minimum time a contractor has been in business. There are requirements for certified statements as to their qualification, their financial standing, etc. Most of these institutions seek and qualify those with a proven track record of customer satisfaction. There are also minimum sales requirements. *(More about financing in a later chapter).*

Gary Delman, President of Sunrise Windows (another second generation manufacturer) stated that "Home improvements represent over \$300 billion in products and services purchased annually. As such, this represents a cornerstone of the US economy."

While many home improvement products represent a 'want' - - things like a leaking roof or a breakdown in the heating and air conditioning unit represent an immediate 'need'. Mr. Delman believes replacement windows fall into the same category. His company's research indicates that the concept of replacing windows as a priority in energy management and reduced maintenance is supported by the Department of Energy and other government agencies. He also suggests that every homeowner familiarize themselves with the Department of Energy's booklet "Tips on Saving Energy & Money at Home" (<http://www.energysavers.gov>).

Next we will examine the all-too important question of who should install your replacement window(s).

Chapter 5: Who should install the replacement window?

"If the job's done well, it should look as if the windows were never replaced at all. Ultimately, the homeowner gets the best of all possible worlds: the comfort and energy-saving of modern replacement windows, smoothly integrated into the architectural look and feel of the home. And, as with any project that's complex and requires investment, you're best bet is to entrust it to those who specialize."

- - Jim Cory, Editor, Replacement Contractor Magazine

For most people this is not a do-it-yourself project. A major consideration is that when the window is put in place and finished it does not look like something has been modified or replaced. It should also fit into the architecture of the home. Even those who have carpentry skills or are exceptionally gifted at home repair projects are wise to hire someone with the proper equipment, experience and know-how. For the best results with your project, search for and find contractors who specialize in the sale and installation of replacement windows. All too often homeowners make the mistake of hiring a contractor with general carpentry skills or one who works in new construction and has experience in the installation of "prime" windows.

Replacement window installations work best when entrusted to a specialist. Many window replacement companies only sell and install replacement windows. Even those who sell other products may have a separate window replacement department. These companies employ specialists who are experienced in almost every condition which is faced when you remove and replace a window. Many of these companies have provided essential information to manufacturers regarding

special conditions which exist in certain window replacement projects, thus they are a source for research and development for the manufacturer.

So what is the difference between installing windows in new construction and installing replacement windows? In new construction, the opening is often a pre-determined and regulated size. The prime window, once acquired, is installed into the open area and usually has a nailing flange, which enables it to be nailed into the sheathing and the framing. Incidental size irregularities can be addressed by adjusting the size of the opening to compensate for a slightly larger window or shimming to compensate for a slightly smaller window.

Generally, older homes (anything over eight years) may have started out with a window opening that was both "square" and "plumb". Through the years, expansion and contraction, the vagaries of the weather, and even minor settling of the foundation may have created a condition where one side of the window is slightly higher than the other and the same may be true of the width.

In utilizing the services of a specialty replacement window company, the windows are first measured by the contractor representative to effectively price the project. The windows are frequently re-measured prior to placing the order with the manufacturer. The re-measuring and ordering take into consideration the issues uncovered by the representative who inspected and measured the windows. The windows are ordered, then custom built to respond to the specific situation.

Professional window replacement installers working for the contractor will make necessary adjustments in the installation of the new replacement window to ensure that to the naked eye the new window appears both "level" and "plumb". However, only wooden windows can be cut or planed down to an appropriate size and still accommodate the proper installation (this excludes windows made of metal, fiberglass or a composite material). Installation specialists for window replacement companies are trained in how to accomplish this.

There are additional ways in which the installation of windows in a new construction project differs from those that are installed in an existing dwelling. The carpenter or window installer on new construction doesn't have to be concerned about plantings around the house, drapes or furniture in the house - or other finished surfaces which adjoin the frame of the new window. On the other hand, homeowners purchasing replacement windows are wise to discuss special situations with a representative of the company and be reassured as to how these will be dealt with. Prior to the installation, the homeowner is wise to move their furniture away from the project and temporarily remove pictures, plaques and other wall hangings away from the wall area surrounding the window.

The seasoned replacement window contractor has equipment, ladders and special staging to compensate for finished and planted areas in and around the home. They also work with special tools to simplify the removal of the old window as well as special sealants to prevent leakage around the newly installed window and to protect against insect infiltration. Many of these seasoned contractors require that their installers either remove their shoes when entering your home or cover them with "booties" similar to those worn by personnel in hospitals. These are situations which you as a homeowner can discuss with the window replacement contractor you select.

As part of their contract, the replacement window contractor will remove the job-connected debris as well as the old windows which have been replaced and see to it that they are disposed of carefully. No job is truly complete until this debris has been removed. All contracts for the removal and replacement of windows should specify how these special situations will be dealt with.

To effectively determine how many of the existing windows require replacement, homeowners should consider an inspection of all the windows in their home, even if it is their intention to replace only a portion of them. A professional representative of the window replacement contractor can advise homeowners of special conditions which may exist with specific windows. This would also include advising as to which

window replacements should be considered a priority. Unlike other home improvement projects, replacement windows can be dealt with as a piecemeal project. An owner can replace three, four or five windows at a time, although he might pay a slight premium for a smaller project rather than replacing all of the windows. If this is the case, it is wise to stay with the same manufacturer when the work is done in segments or stages.

When possible, it is best to replace all of the windows in the house at one time. However, in some cases there are budget considerations which make it necessary to replace the windows in several stages. Many replacement window contractors offer price guarantees if the staged replacement method is used. Whatever you decide to do, it is still wise to have someone evaluate all of the windows and submit a "window inspection evaluation".

The majority of companies who sell replacement windows also provide an installation service, usually with some sort of a satisfaction warranty. Many of these "dealers" confine themselves to selling and installing only one or two brands. This makes them efficient in understanding the benefits and options of a specific window and how it can be fitted to accommodate complex issues that arise when installing it in the home.

Some manufacturers have certification programs which offer special training to those who install the windows. Some have "hotlines" for those in the service department if and when they run into a particular difficulty in an installation.

Some manufacturers can (will) provide an energy saving guarantee if all of the windows in the home are replaced at one time, thus enabling the company to evaluate heat loss/gain prior to and after the installation. Homeowners should inquire of the replacement contractor if such a guarantee can be made available through the manufacturer providing their windows.

Many communities require a permit for the installation of replacement windows. In such cases, most replacement window contractors will apply for and acquire the permit for the homeowner as a part of the installation process. The Better Business Bureau cautions that if the contractor suggests that you personally get the required building permits, it may be a sign that the contractor is trying to avoid contact with the local agency that issues such permits. In many communities, the contractor is required to produce his state/local license or registration before the permit is procured. We will discuss this further in a following chapter.

As earlier stated, the replacement window industry is booming. The result of this has been an increased number of companies across the United States - so with all of these choices how do you, the homeowner, select the best contractor?

Chapter 6: How to select a replacement window contractor

"In many cases, the best contractor to order and install your windows has researched manufacturers to determine who makes the best product for the climate and other weather conditions in your area. Many replacement window contractors offer only one or two brands, each having options so as to fit all aspects of your home and your budget."

- - Don Bruce

In 2007, it is estimated that over 33 million windows were manufactured for use in replacement window projects. Another 23 million were manufactured for use in new construction. By now you know the difference between these two types of windows. Those 33 million windows went into homes and apartments, many just like yours. They were made of wood, aluminum, vinyl, fiberglass or composite material. They were purchased from and installed by large and small companies, many who advertise broadly, some who might have shown up on the doorstep soliciting business. The windows were frequently offered in different price categories. Some included options that were arguably difficult for lay people to understand because many windows in different price categories look the same to the untrained eye. The truth is you may have to call on the expertise of those offering you information on the sale of these products to really understand what your needs are for your home.

As you seek information for your replacement window project you may get bombarded with information and options, including various price ranges. Some of the printed information will be elaborate and in glossy, professional-looking formats. Others may be simple one-page printed sheets exhorting you to inquire for an

estimate. You may have seen models/samples of the window at a home show, at a mall, in a contractor's showroom or on the house of a neighbor or friend. How do you decide who to contact for your replacement window project?

First, consider some of the cautions to exercise in your search. Most of the following suggestions are recommended by the Federal Trade Commission (<http://www.ftc.gov>) (877-FTC-HELP/877-382-4357). Among other things, they suggest the following:

- **Beware of contractors who ask you to pay for the entire job up front**

Most replacement contractors will request a deposit since once they measure your windows and have them manufactured, they have a sizable investment in your project. The down payment may vary and in some states there are limitations.

- **Pay by check or credit card**

If you pay in cash, you have no real record of the transaction and you may have problems documenting your case if you have a problem or a tax issue.

- **All estimates should be detailed and in writing**

In most cases, the estimate will become the contract if you decide to buy. Typically you do not pay for estimates from replacement window contractors. This will vary if your windows are part of a remodeling contract or what is referred to as a "design and build" project.

- **Don't automatically choose the lowest bidder**

Your job may have special requirements which require certain options. Be sure you compare apples to apples.

- **Deal with licensed contractors**

If you have responded to an ad, a direct mail piece or visited a website which indicates the contractor is licensed, you can call the licensing bureau in your city or state and verify that this information is factual. Don't assume that because

someone is advertised as being licensed that they are. Also, many contractors will have a copy of their license in their presentation book for you to review; if not, request a copy.

Some states (such as Maryland) require that the salesperson be licensed independently even when working for a contractor.

- **Beware of anyone who does not list a business phone number in the local directory**

It is not necessary that they have an ad in the yellow pages; however, the lack of simple phone access to a contractor could be a red flag indicating that the contractor may not have an established business presence in your state or community.

Despite what you may have heard to the contrary, there is a **better and best way to search for and get the most competent contractor**. In many cases, this contractor has researched manufacturers to determine who makes the best product for the climate and other weather conditions in your area. Once your windows have been inspected, the contractor will also consider the architectural demands of the home. Many window replacement contractors offer only one or two brands, each having options so as to fit all aspects of your home and your budget.

When contacted, the contractor may request an appointment allowing an hour or more to survey your project. Don't be misled. Without sufficient time (usually one hour minimum) to inspect each window and uncover issues that you, the homeowner, did not detect on your own, no one can examine the project to determine what your specific needs are.

Remember, this is a major project. Frequently, when the contractor suggests that "all interested parties be present" when the inspection is made, many homeowners tend to get offended, believing that they want the husband and wife (as an example)

present to effect a quick sale. This is not a project which tends to be more in the interest of either a male or a female. It is suggested that all of the owners or those who will be involved in paying for the project be present because this is not a simple purchase that involves limited decision-making. Issues such as design, architectural compatibility, colors, style and options are decisions that should be made by both parties. Interested parties should listen to the information and ask the questions pertinent to how this product fits their needs before a decision is made.

Again, there are cautions and concerns that have to be exercised. If the following information is not presented it is prudent for homeowners to ask about these issues. Later, we will also discuss conditions which should appear in the contract for your protection.

Inquire if the contractor carries worker's compensation insurance (which is required in most states). In many cases this provision will be mentioned in the contract, such as "We carry worker's compensation and public liability insurance on all work." Most experienced contractors carry a certificate provided by their insurer validating that they carry worker's compensation and public liability insurance. This is also true of certificates validating their license.

Why is the latter so important? Many homeowners are of the impression that their homeowner's insurance has provisions which protect them in these cases; however, take a moment and check your insurance coverage before you make such an assumption. If the contractor is not insured and is accompanied by a "helper" who is also not insured, and either of them is injured, they may be in a position to file a claim against you (the homeowner) for injuries acquired on the jobsite. This is one of the basic purposes of worker's compensation coverage.

If a passerby or neighbor's pet is injured by the contractor's equipment or pieces of material, this could create a liability claim against the homeowner, in spite of the fact that there is a contract for performance. Prior to the installation, request a

copy of the insurance certificates which the contractor obtains from its insurer. In some cases, a homeowner can also get additional coverage inexpensively from their insurance carrier.

Both the Federal Trade Commission and Better Business Bureau suggest that you ask if the contractor is a member of a professional association which has standards and a code of ethics for remodelers. Many consumer groups advise homeowners to contact the Better Business Bureau after they have spoken to a contractor and before they make a decision. The BBB can often advise you how long a contractor has been in business and if and how they are responsive to complaints. In this modern age, it is wise to check on a contractor or sales representative in advance of their inspection and pricing at your home. Having this information "in hand" enhances your understanding of the information being provided and the credibility of the individual providing it.

Proposals and contracts presented by a window replacement company may vary. They should be inclusive of content which protects both the buyer and the seller. Many states have requirements as to the structure of the contract. To start out with some basics, never sign a partial or blank contract and be sure you retain a copy of everything you have signed. Minimally, a retail contract will contain the contractor's full name, address and telephone number, along with a license number (if this is required in your state). As previously stated, the proposal may become a contract if you and the contractor agree to do business. In any case, the specifications in the contract should spell out **in detail** exactly what is to be done, the number of windows being installed and in special cases, where certain windows of the house require special treatment (example: Low-E coating). Any special conditions or options discussed with the contractor or his representative need to be indicated in the contract. Brand names, colors and other incidentals should be spelled out.

Special areas of the contract should provide for the warranty clause as specified together with any limitation which might be imposed. It should call for the removal

of job-connected debris and a payment schedule outlining the cost of the job, as well as any deposit made and the cash balance. Most window replacement contracts are required by Federal Law (and in some cases state laws as well) to contain a provision permitting the rescission (cancellation) of the contract within a specified time **(see below)**.

The Federal Government and many states have legislation which states that when you sign a home improvement contract in your home with a contractor or his agent, you have three business days in which to change your mind.

The rules differ from state to state. You may wish to check by contacting your local Better Business Bureau and inquiring about the requirements in your locale. Then find the appropriate state authority which has published forms advising you of your rights. These are usually found on the Internet.

In almost all cases, the following text or similar must appear in the contract in close proximity to your signature:

“You, the buyer may cancel this transaction at any time prior to midnight of the third business day after the date of this transaction. See the attached notice of cancellation form for an explanation of this right...”

In addition, the contractor is required to provide each person who signs the contract with copies of a completed form which is captioned:

“Notice of right to cancel” or “Notice of cancellation.”

None of the above obviates the requirements of prudent buying. Getting two or three estimates will not help if you haven't been provided clear information about what you are actually buying and from whom.

Most reputable replacement window companies work hard at providing customer satisfaction. They are constantly seeking information that enables them to perform better. **Murray Gross**, a member of the Board of Governors of **HIMS** (www.himsgroup.com), an organization of large home improvement companies dedicated to maintaining customer satisfaction through ethical standards, agrees with our recommendation regarding the Better Business Bureau. He also suggests that many companies are members of **NARI** - National Association of the Remodeling Industry - (www.nari.org) and/or **NAHB** - The National Association of Home Builders/Remodeler's Council - (www.nahb.org). Mr. Gross stated that in an industry the size of home improvement, which is estimated at \$300+ billion a year annually, most forward-thinking companies align themselves with peer groups with the intention of improving and maintaining customer satisfaction standards.

Most established contractors offer a plan for you to obtain financing for your window replacement project. This frequently creates a convenience, enabling a homeowner to complete all the essential elements of the home improvement project at one time. In addition to the convenience, the homeowner may be able to take advantage of special financing offers or incentives that are provided through the contractor by the lender.

First, it is important for the homeowner to have established a level of confidence in the qualified contractor with whom they are dealing before they examine the manner in which the financing is arranged.

When we asked **Bruce Christensen**, VP of GE-Money (General Electric Home Improvement Sales Finance Division) as to why a homeowner should use this kind of financing source as opposed to their own bank, he responded, "Beyond the conveniences already stated, a straightforward home improvement loan is often a good option, providing flexible terms and, in this environment of relatively low interest rates, special incentives deferring interest and/or payments for periods of three, six and sometimes twelve months. There is rarely any penalty for loan prepayment and the process is usually fast and easy."

So naturally our next question was what are the steps in the process? He again responded, "Generally, this is how the process works with most institutions:

- You will be asked to complete a credit application, which will usually include personal information, such as date of birth, employment, etc. This is essentially the same kind of application you would prepare if going to your local bank.
- The contractor will submit your application to the lender identified on the credit application. The lender will evaluate your credit application using automated techniques such as credit scoring, where a variety of factors, like your credit history, length of employment, income and debts may be weighted and scored.
- The lender will advise the contractor of the credit decision and the maximum loan amount it is willing to lend. In many cases, the lender will be willing to lend more than the amount of the project, allowing for upgrades or additional work.
- The lender does not fund or pay the contractor for the project until the project is complete and satisfies the consumer, which provides an incentive for the contractor to complete the project in accordance with the specifications in the contract and in a timely manner."

The latter information will be helpful to you when arranging for a method to pay for your replacement windows. Don't be reluctant to ask the contractor questions regarding the above tips. And if you're not familiar with the name of the financial institution, remember it will appear on the documents (such as the credit application) and you can go online immediately to find out who they are.

Replacing your windows can be an exciting experience. Beyond the modernized look and feel it will bring to your home, the many energy and maintenance-saving benefits will pay dividends. Most knowledgeable sources believe that if you follow the concepts in chapters 5 and 6 it will tend to make your project more enjoyable.

In the next chapter, we will attempt to answer some of the most commonly asked questions about replacement windows.

Chapter 7: Questions & Answers

Here is a synopsis of the questions which are most frequently asked about replacement windows:

Question: If I have my windows replaced now, how long can I expect them to last?

Answer: Much depends on the quality of window you have installed and the options you select. A high quality replacement window properly installed should maintain its usefulness and efficiency for 35 years or more.

Q: So, is it possible to acquire replacement windows which will not, during our life in our home, require replacement?

A: The answer to your question is probably yes. Eliminating acts of God, fire or breakage by external accidents, good quality windows are made to last and sustain normal usage.

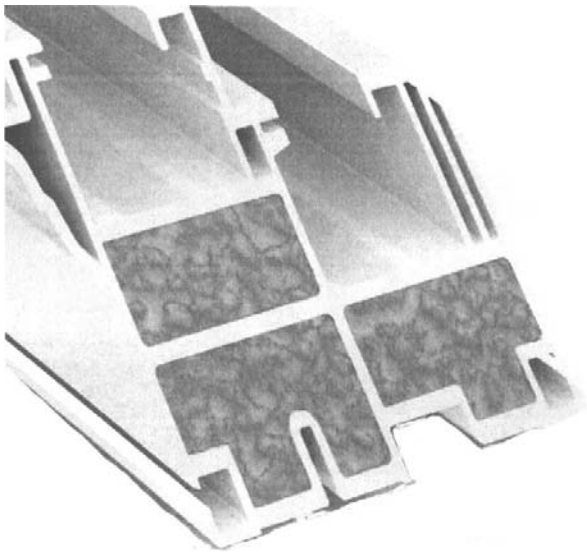
Q: How do I, as a lay person, know the difference between a high quality window and one of lesser quality?

A: If you purchase the highest quality replacement window or one of a much lower quality at a much lower price, once installed, to the average eye, they will look the same. However, once installed these windows will be subject to expansion and contraction, excessive climates and other vagaries of the weather, including wear and tear from operation (raising, lowering, sliding). Because of this, it is important to see what the inside of the window frame looks like and what is built into its manufacture to deal with these elements.

Q: How do I see the inside of the window frame and how will I know what I'm looking for?

A: Representatives of most window companies carry a cut-away sample which they can bring into your home so you can see the way the extrusion looks inside of the sash (**See illustration C**). They will also usually have a "corner" section exhibiting both the side of the window (side rail) and the lower rail which sits on the sill (**See illustration D**). Most companies will also have a working model of the window they specify for your home. You will be able to operate this and observe how the window actually works.

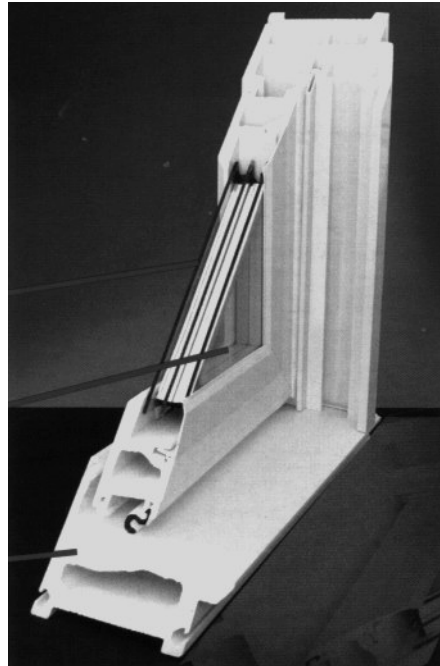
Illustration C



Cut-away of extrusion w/ insulated core

(Courtesy of Sunrise Windows)

Illustration D



(Courtesy of True Home Value)

Also, many replacement window contractors maintain showrooms enabling you to view and test out windows prior to having someone visit your home. You can expect to receive valuable information and a good learning experience. You may

ask to be shown how the windows move up and down (double-hung), side to side (slider) or crank in and out (casement).

Q: Let's do it again on that double-hung, casement and slider information.

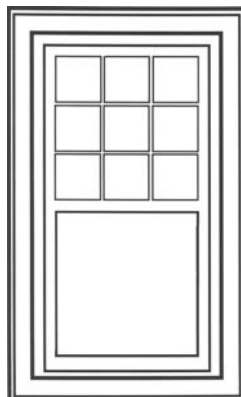
A: Okay, starting with the casement. This is a window which usually operates on a crank situated on the lower part of the window. The window swings open either to the left or the right (you can choose which) utilizing side hinges.

Q: What about the double-hung?

A: In this case, when the window is unlocked, the lower sash can be raised upward (this is often also called the inner sash) – and the upper sash can be drawn down (this is often called the outer sash).

Double-hung windows can also utilize different glass patterns in the upper sash vs. the lower sash. In illustration **(E)**, the upper sash has a series of bars which look like a tic-tac-toe pattern. These are called mutton bars and can be simulated in a replacement window by utilizing something called grids.

Illustration E



(Courtesy of Thermal Industries)

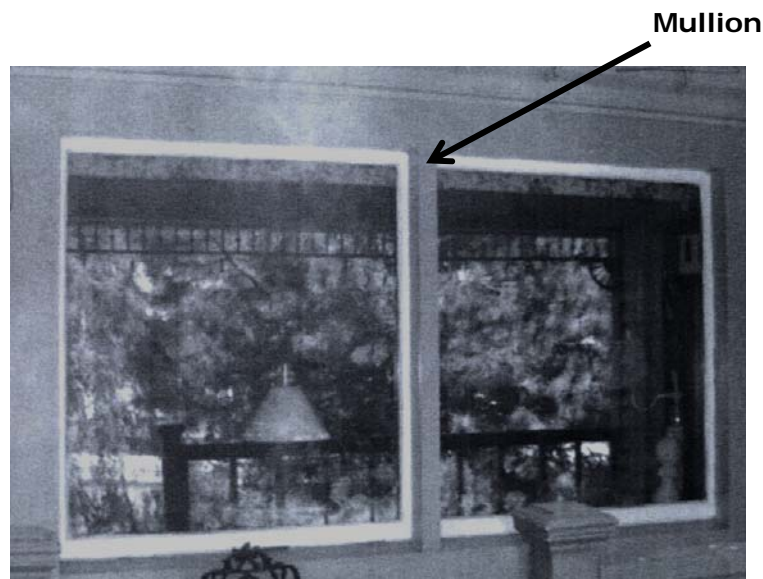
Q: What about the slider?

A: For a moment, envision the double-hung window being laid on its side so that the two sashes, when unlocked, can pass each other because they're riding on divided tracks. The slider window moves from side to side on tracks built for ease of operation. In most cases, each one of the sections can be removed for cleaning.

Q: What other parts of the window should I be familiar with?

A: We explained the "**mutton bars**", which might be present in original windows. Then there are **mullions**. When you see two windows side-by-side almost touching, installed between the two windows is something called a mullion (**See illustration F**). This serves to separate the two windows and provide reinforcement for both the original installation and the replacement window.

Illustration F



(Courtesy of Faerber's Bee Window)

A **jamb** is what the window fits into. It is the framing which supports the windows in the wall. There's one jamb on each side of the window and one across the top. The piece across the bottom is called the **sill** (**See illustration G**).

Illustration G



(Courtesy of Renaissance Exteriors)

When your replacement window contractor talks about the **sash** he's referring to the entire window or upper/lower sashes. When he refers to the **lites**, he is talking about the panes of glass in the window.

Q: Is there anything else I have to know about the various styles or parts of a window?

A: Not really. As I said earlier, if the contractor you select has a showroom, visit it before someone comes to your home. Don't expect an estimate until they've actually seen your windows (more on this later); however, you will be able to get a better feel for the windows and the options which best fit your home.

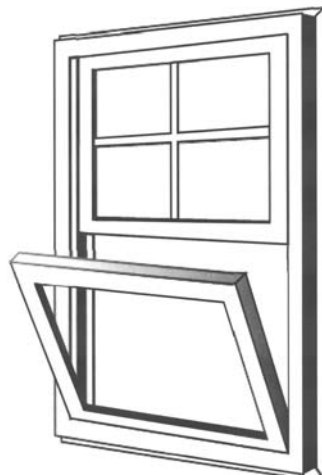
There is also a caution. You can get to know all the buzz words and forget your goal is to get the best window for your home. However, if you really want a glossary, you might visit the website of Window and Door Manufacturers Association (<http://www.wdma.com>) and look up "The Language of Windows."

Q: I've heard about easy to clean and low or no maintenance connected to replacement windows.

A: Most replacement window contractors offer a product which eliminates the need for painting the window itself. Some contractors offer an option which enables owners to select different finishes for the interior.

Beyond the sashes moving up and down or side to side, most sashes are removable. In this illustration (**H**), you see a model of a double-hung window which has a feature enabling the homeowner to wash the inside and outside of the window without removing the sash.

Illustration H



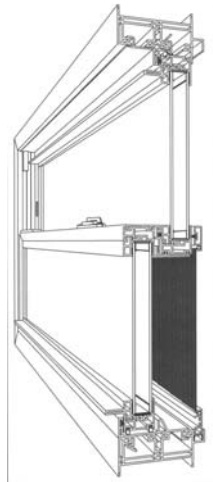
(Courtesy of Thermal Industries)

Q: How does glass become insulated?

A: Envision two separate panes of glass of equal size being held facing each other about an inch apart. These two pieces of glass will be joined and separated by a seal which binds the two pieces together while still maintaining the separation.

(See illustration A).

Illustration A



(Courtesy of Thermal Industries)

Now, before this glass is connected in the fashion above, it is coated with a virtually clear material called Low-E which, if installed properly, will cut the transmission of ultraviolet rays that would normally pass through a single pane or multiple panes of untreated glass. This coating is installed to prevent the damage that ultraviolet rays can cause by fading interior furnishings. In addition, it improves the thermal efficiency of the window.

There is also the option of pumping a clear, invisible gas into the void between these two panes of glass (before they are sealed). This will provide more thermal efficiency than simply having air between the panes. The most commonly used gas for this purpose is called **argon**.

Q: Would this gas be harmful to humans if the glass is broken or the seal should fail?

A: Argon gas is non-reactive. It is part of the air we breathe and will not harm you. As described by a common phrase in chemistry is it is inert.

Most quality windows are certified against seal failure utilizing a special standard which enables them to do so. The glass components, including the seals, represent one of the greatest leaps forward in window manufacturing over the past 25 years.

Major manufacturers follow standards initiated by (**IGMA – the Insulated Glass Manufacturers Alliance**). Further, according to **The National Glass Association (NGA)**, even if there were minor seepage (1% every year or so), and even if only 80% of the gas remains, this glass package will still maintain its effectiveness. Here again, we stress the importance of the good sealing process between those two panes of glass - without this, fogging will be created inside of the cavity.

Q: In chapters 2 and 3, there are abundant references to “Low-E glass.” Do these references imply that Low-E is a must and if the window has a Low-E coating it will accomplish most of the goals related to heat loss/gain management?

A: The answer to your question is complicated. This is a large country, with many climate variations and weather differences. In turn, there are different applications of Low-E coating and many times these are coupled with other options.

When you select a contractor to replace your windows, ask for an explanation regarding Low-E coatings, their various options as well as supplemental techniques which increase their efficiency. A qualified replacement window contractor in your market will have studies made available to him by his manufacturer.

If you desire more in-depth information regarding glass coatings, check out the following websites:

- PPG Industries has an easy-to-read illustrated page:
<http://corporateportal.ppg.com/NA/Glass/ResidentialGlass/Homeowners/ProductInformation>
- An equally good site to examine is Cardinal Glass Industries at
<http://www.cardinalcorp.com>

Some Questions about Your Relationship with a Contractor

Q: Why do you stress calling the Better Business Bureau (BBB) before the contractor gives you a price?

A: I am aware that the prevailing wisdom suggests that after someone gives you a price you can call the Better Business Bureau. Calling the BBB before you make an appointment to allow someone in your home makes more sense to me.

You want to be dealing with someone who has an established address and phone number, is licensed and maintains insurance coverage, but even more, you want someone with good credentials and a history of responding to customer service issues in a prompt and reasonable manner. So my suggestion is to call the BBB prior to inviting someone into your home. They can't tell you whether the contractor is insured, or much about the products he sells, but the information they will provide will guide you in assessing the credibility of the company/individual you are dealing with. Therefore, it is better to receive this information before rather than after the presentation in your home.

Q: Should I be able to receive a "rough estimate" either over the phone or at the contractor's showroom?

A: The answer lies in the word **rough**. If a contractor has not seen your windows, determined which side of your house has the major weather exposures, has not detected if there is frame damage around the windows, or determined which

particular style of window meets the architectural structure of your home you will undoubtedly get a **“very rough”** estimate.

I am aware that people often ask (even demand) rough estimates or what many call “ballpark figures.” I am equally aware that when they get the final estimate(s), they are often disillusioned or disappointed. The Better Business Bureau suggests any estimate should be in writing and should be specific.

The pricing for replacement windows is based on united inches (which is the combination of the height **plus** the width of the window). It is only after someone measures your actual windows and has examined the existing conditions which will be faced in removing and replacing the windows that they can give you accurate pricing. My advice is to save yourself the disappointment and often misinformation that comes with “ballpark figures.” Instead, ask for a specific and factual proposal on what your investment would be - only after someone has inspected your windows.

Q: If someone advises me that I need a certain number of my windows replaced, how can I tell whether their information is factual?

A: The answer lies in the questions asked. When someone says your specific window(s) require replacement, the basic question to ask is “why?” A qualified window replacement specialist will be able to point out to you the deficiencies in your window: frame, glass, hardware, balances, etc. In other cases, they will be able to demonstrate the inefficiency of the glass package which you have in your windows that may be causing major heat loss or gain.

Q: Suppose someone is soliciting business in my neighborhood to encourage me to consider replacing my windows. Does the fact that they are soliciting or canvassing in the neighborhood reduce their reliability?

A: Today one of the major expenses facing most people in service businesses (such as those installing windows) is the high cost of advertising. Therefore it is not uncommon for many extremely reliable companies to solicit business in neighborhoods surrounding jobs that they have recently completed. These solicitors are not usually attempting to sell you windows; they are soliciting for an opportunity to inspect your windows and give you a proposal. Most companies utilizing this business solitication method are looking to set up an appointment with you at a later time. If you are in doubt, once you are solicited be sure you know the name, address and phone number of anyone with whom you are making the appointment. Again, my advice is to contact the Better Business Bureau before you let them into your home.

Q: Once I decide to have replacement windows installed on my home and sign a contract, how long should it be before the windows are installed?

A: A general rule of thumb: four to six weeks from the time you order the windows. This will vary with the size of the job, the number of special size windows ordered, and the weather - all of which could lengthen that time period. Despite the fact that your windows can be installed from the inside, inclement weather often prevents the contractor from removing the original window.

Q: After the windows are installed and before the contractor leaves, do you have any suggestions?

A: Have the installer or company representative walk you through the operation of the windows. Don't watch, participate. Raise and lower double-hung windows. Note the ease of movement or difficulty. Crank casement windows in and out for ease of operation and move sliders side-to-side for the same reason. Test the hardware, observe each window from the inside and outside (if possible).

Now, we will conclude this book with an analysis of the "Cost vs. Value Survey" (provided by Hanley Wood).

Chapter 8: So - are replacement windows a good investment?

*“There are essentially two kinds of remodeling projects: those we **want** to do, and those we **have to do**. Exterior makeovers, such as siding, roofing and window replacement fall in the latter category, but the good news is they all rate high on the list of cost recovered (return on investment).”*

- - Remodeling Magazine

Despite what you might now know about replacement windows, such as how they originated, the many options to consider when you order them, and what they can do to reduce your cost of maintenance and energy management, the question that you have to inevitably ask is **“Are they a good investment?”**

Among the many supports which we offer to validate the investment quality of replacement windows, none serves homeowners better than the annual **Cost vs. Value** report produced by **Remodeling Magazine**. For twenty years, this project has served homeowners by enabling them to see what their potential investment return is when they eventually sell their home.

The fact is that most people don't undertake home improvement projects with the intention of selling their home soon after the work is completed. Most home improvement projects are undertaken for the very reason implied by the name: to improve the home.

Many home improvement projects, while upgrading the home and improving its value, provide a comfort, ease of use and even an enjoyment that seldom can be

measured purely in dollars and cents. According to those who produce the remodeling Cost vs. Value studies:

“There are essentially two kinds of remodeling projects: those we **want** to do, and those we **have to** do. Exterior makeovers, such as siding, roofing and window replacement fall in the latter category, but the good news is they all rate high on the list of cost recovered (return on investment).

New windows and insulated siding also offer energy savings that seem to be uppermost in the minds of most home buyers.”

- **Remodeling Magazine**, November 2007

Sal Alfano, Editorial Director for Hanley Wood, the parent company for Remodeling Magazine states:

“Remodeling is a good investment. Studies for 2007 indicate two-thirds of the projects studied in 2007 returned between 65% and 80% at resale.

The Cost vs. Value survey is produced out of the research of three separate organizations.

The Washington, D.C.-based **National Association of Realtors** (www.realtor.org) broadcasted e-mail links of the survey to more than 100,000 of its members, comprising sales agents, brokers, and appraisers.

Hometech Information Systems (www.hometechonline.com), the Bethesda, MD-based estimating software developer, provided cost-to-construct estimates for all remodeling projects, including geographic area-modifiers for each of the 60 metro cities surveyed.

Specpan (www.specpan.com), an Indianapolis-based market research company, programmed and hosted the Web-based survey, collected and compiled the data, and provided pre- and post-survey consulting.

Before we insert the first table to make you aware of the national averages, it is important to note that the **cost** segment of the survey comes from **Hometech Information Systems** (see above) who, in turn, collects current cost information from a nationwide network of remodeling/home improvement contractors and suppliers. These construction costs include labor, material, overhead and profit.

The **value** segment of the survey (cost recovered/recouped) is provided from data received from the **National Association of Realtors** (see above) and is in response to e-mail surveys containing project descriptions and construction costs for each city.

Respondents were instructed to use retail values without making judgments about the motivation of the homeowner in either the decision to undertake the replacement window project or to sell the house.

The **data aggregation** (data from the Cost vs. Value survey) was administered by **Specpan** (see above). This company specializes in business-to-business web based surveys.

Let's take a look at the national averages. You will note that the survey only considers replacement windows made of either wood or vinyl. The industry does however recognize the prominence of windows made of fiberglass, composite materials and aluminum. Both fiberglass and composite materials would be classified within the same price ranges (mid-range to upscale).

Cost vs. Value Survey*
2007 National Averages – vs. 2006 Data

2007	Job Cost	Value at Sale	Cost Recovered
MIDRANGE			
Windows Replacement - Vinyl	\$10,448	\$ 8,290	79.3%
Windows Replacement - Wood	\$11,384	\$ 9,241	81.2%
UPSCALE			
Windows Replacement - Vinyl	\$13,479	\$10,913	81.0%
Windows Replacement - Wood	\$17,383	\$13,784	79.3%
2006			
MIDRANGE			
Windows Replacement - Vinyl	10,160	8,500	83.7%
Windows Replacement - Wood	11,040	9,416	85.3%
UPSCALE			
Windows Replacement - Vinyl	13,120	11,109	84.7%
Windows Replacement - Wood	16,910	13,952	82.5%

The entire survey (Cost vs. Value) is provided by **Remodeling Magazine**, a Hanley Wood publication (www.hanleywood.com). In an effort to increase the reliability of the numbers provided, **Remodeling Magazine** has also grouped the results according to the US Census Bureau's 9 regional divisions. Check the pages which follow to determine the data which is applicable to your specific state.

* More data regarding this study is available via <http://www.costvsvalue.com/>

Chapter 8 asks the question: **So – Are Replacement Windows a Good Investment?** We leave the final decision up to you. We hope that we have provided you with sufficient information to enable you to make the proper decision about replacement windows. We thank our many researchers and contributors and - we also thank you for acquiring this book.

Appendix: Regional Cost vs. Value Results

New England CT, MA, ME, NH, RI, VT

2007	Job Cost	Resale Value	Cost Recovered
MIDRANGE			
Windows Replacement - Vinyl	10,702	8,698	81.3%
Windows Replacement - Wood	11,697	9,514	81.3%
UPSCALE			
Windows Replacement - Vinyl	13,913	11,470	82.4%
Windows Replacement - Wood	17,729	13,682	77.2%
2006			
MIDRANGE			
Windows Replacement - Vinyl	10,201	8,830	86.6%
Windows Replacement - Wood	11,218	10,276	91.6%
UPSCALE			
Windows Replacement - Vinyl	13,295	11,756	88.4%
Windows Replacement - Wood	17,054	14,049	82.4%

Middle Atlantic

NJ, NY, PA

2007	Job Cost	Resale Value	Cost Recouped
MIDRANGE			
Windows Replacement - Vinyl	11,083	8,627	77.8%
Windows Replacement - Wood	12,026	9,793	81.4%
UPSCALE			
Windows Replacement - Vinyl	14,394	11,152	77.5%
Windows Replacement - Wood	18,180	13,958	76.8%
2006			
MIDRANGE			
Windows Replacement - Vinyl	10,682	9,523	89.2%
Windows Replacement - Wood	11,610	10,095	87.0%
UPSCALE			
Windows Replacement - Vinyl	13,870	12,132	87.5%
Windows Replacement - Wood	17,607	14,879	84.5%

South Atlantic

DE, DC, FL, GA, MD, NC, SC, VA, WV

2007	Job Cost	Resale Value	Cost Recovered
MIDRANGE			
Windows Replacement - Vinyl	9,391	7,530	80.2%
Windows Replacement - Wood	10,242	8,226	80.3%
UPSCALE			
Windows Replacement - Vinyl	12,084	9,791	81.0%
Windows Replacement - Wood	15,980	12,334	77.2%
2006			
MIDRANGE			
Windows Replacement - Vinyl	9,162	7,450	81.3%
Windows Replacement - Wood	9,974	8,559	85.8%
UPSCALE			
Windows Replacement - Vinyl	11,823	10,261	86.8%
Windows Replacement - Wood	15,607	12,985	83.2%

East North Central

IN, IL, MI, OH, WI

2007	Job Cost	Resale Value	Cost Recovered
MIDRANGE			
Windows Replacement - Vinyl	11,011	7,894	71.7%
Windows Replacement - Wood	12,146	8,758	72.1%
UPSCALE			
Windows Replacement - Vinyl	14,289	10,212	71.5%
Windows Replacement - Wood	18,271	12,922	70.7%
2006			
MIDRANGE			
Windows Replacement - Vinyl	10,753	8,751	81.4%
Windows Replacement - Wood	11,714	9,174	78.3%
UPSCALE			
Windows Replacement - Vinyl	13,928	10,132	72.7%
Windows Replacement - Wood	17,718	12,883	72.7%

East South Central

AL, KY, MS, TN

2007	Job Cost	Resale Value	Cost Recovered
MIDRANGE			
Windows Replacement - Vinyl	9,571	7,123	74.4%
Windows Replacement - Wood	10,437	8,424	80.7%
UPSCALE			
Windows Replacement - Vinyl	12,351	10,152	82.2%
Windows Replacement - Wood	16,195	12,989	80.2%
2006			
MIDRANGE			
Windows Replacement - Vinyl	9,272	7,786	84.0%
Windows Replacement - Wood	10,076	8,509	84.4%
UPSCALE			
Windows Replacement - Vinyl	11,985	11,250	93.9%
Windows Replacement - Wood	15,693	13,320	84.9%

West North Central
IA, KS, MN, MO, NE, ND, SD

2007	Job Cost	Resale Value	Cost Recouped
MIDRANGE			
Windows Replacement - Vinyl	11,085	8,124	73.3%
Windows Replacement - Wood	12,046	8,550	71.0%
UPSCALE			
Windows Replacement - Vinyl	14,306	10,525	73.6%
Windows Replacement - Wood	18,175	12,565	69.1%
2006			
MIDRANGE			
Windows Replacement - Vinyl	10,796	7,720	71.5%
Windows Replacement - Wood	11,703	8,544	73.0%
UPSCALE			
Windows Replacement - Vinyl	13,917	10,411	74.8%
Windows Replacement - Wood	17,690	12,881	72.8%

West South Central

AR, LA, OK, TX

2007	Job Cost	Resale Value	Cost Recouped
MIDRANGE			
Windows Replacement - Vinyl	9,381	7,498	79.9%
Windows Replacement - Wood	10,174	8,212	80.7%
UPSCALE			
Windows Replacement - Vinyl	11,941	10,080	84.4%
Windows Replacement - Wood	15,899	13,032	82.0%
2006			
MIDRANGE			
Windows Replacement - Vinyl	9,284	6,931	74.7%
Windows Replacement - Wood	10,038	7,946	79.2%
UPSCALE			
Windows Replacement - Vinyl	11,888	9,410	79.2%
Windows Replacement - Wood	15,694	12,355	78.7%

Mountain

AZ, CO, ID, NM, MT, UT, NV, WY

2007	Job Cost	Resale Value	Cost Recovered
MIDRANGE			
Windows Replacement - Vinyl	10,055	7,665	76.2%
Windows Replacement - Wood	10,939	8,905	81.4%
UPSCALE			
Windows Replacement - Vinyl	12,813	10,175	79.4%
Windows Replacement - Wood	16,871	13,578	80.5%
2006			
MIDRANGE			
Windows Replacement - Vinyl	9,862	8,369	84.9%
Windows Replacement - Wood	10,688	9,052	84.7%
UPSCALE			
Windows Replacement - Vinyl	12,608	10,907	86.5%
Windows Replacement - Wood	16,502	14,035	85.1%

Pacific
CA, OR, WA

2007	Job Cost	Resale Value	Cost Recovered
MIDRANGE			
Windows Replacement - Vinyl	12,164	11,978	98.5%
Windows Replacement - Wood	13,121	13,497	102.9%
UPSCALE			
Windows Replacement - Vinyl	15,743	15,855	100.7%
Windows Replacement - Wood	19,608	20,270	103.4%
2006			
MIDRANGE			
Windows Replacement - Vinyl	11,768	11,338	96.3%
Windows Replacement - Wood	12,684	12,963	102.2%
UPSCALE			
Windows Replacement - Vinyl	15,200	14,679	96.6%
Windows Replacement - Wood	19,022	18,877	99.2%