

Foreword by
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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.

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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

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.

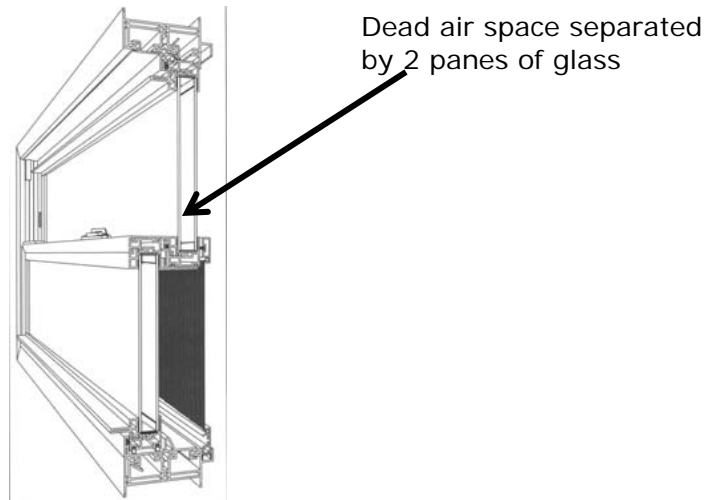
It is even more confounding that in many cases, homeowners are not aware that fogging represents a deficiency. In their defense, the concept is not easy to wrap your head around.

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>)

We thank you for downloading the synopsis of this book - and we hope that you found the contents both practical and informative. In order to purchase the entire book for the nominal fee of \$5.95 - visit our website at www.WindowHelpBook.com.