



## Phantom Motorized Retractable Screens Extend Living Space While Adding Energy Efficiency

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## EXECUTIVE SUMMARY

More than ever before, homeowners are interested in creating the type of outdoor living space that will enhance their enjoyment of—and the energy efficiency of—their home.

To accomplish these goals, homeowners need to do more than simply build a deck or renovate a patio. They need to create a true living space. That means deciding on the best way to enclose the space with the intention of protecting their family and friends from insects, rain, and wind, while also making the home more energy efficient.

Architects and builders are in the position of responding to their client's wishes or pushing the trend forward. Either way, they must make decisions about the best option for maintaining the décor of the home.

The obvious choice for homeowners, architects, and builders is motorized retractable screens. Not only do these screens meet the need to create comfortable and attractive outdoor living spaces that enable occupants to enjoy outdoor views, they are also scientifically proven to enhance the energy efficiency of the entire home.



The New American Home 2016

## THE NEED TO CREATE COMFORTABLE AND ATTRACTIVE OUTDOOR LIVING SPACES

For several years, there has been a steady demand for creating comfortable and attractive outdoor living spaces. And, all signs point to that trend continuing into the future.

According to the first-quarter 2016 American Institute of Architects Home Design Trends Survey, 70% of U.S. firms reported more activity around the design and construction of outdoor living spaces during the quarter. The survey also found that 60% of firms saw an increase in activity concerning "blended indoor/outdoor living," or areas in the home such as a ground floor common room that span interior and exterior spaces.<sup>1</sup>

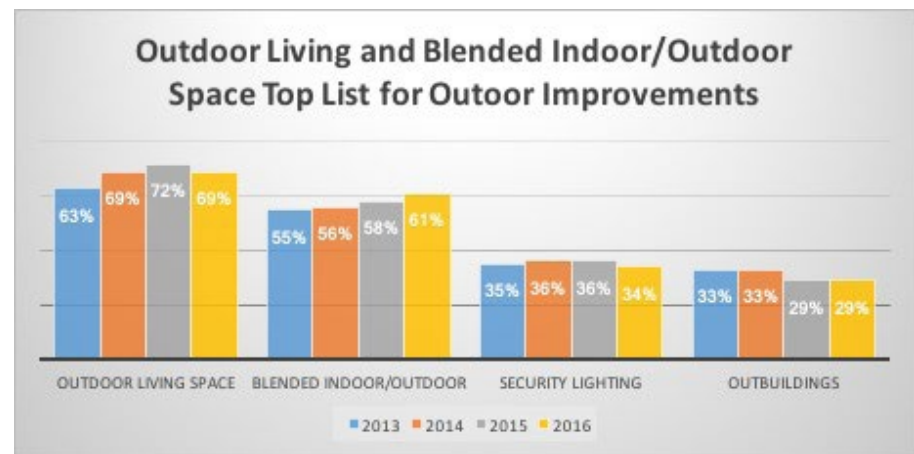


Chart from Independent Two Trails Study

<sup>1</sup> [AIA Home Design Trends Survey Q1 2016](#)

A survey we conducted along with Concerto Marketing highlights this trend. After interviewing 850 homeowners, we found that 60% often think about ways in which they can make their home look or feel better. One of the most important areas was the outdoor deck and patio.<sup>2</sup>

Creating an outdoor living space is one thing. Making that space comfortable is quite another.

This brings up the need to enclose the space in some way so that the occupants can stay warm when it is cold outside and cool when it's hot outside. Another concern is protecting occupants against insects, rain, wind, and debris. Additionally, there is the need to protect indoor furniture and other materials that may be harmed by the sun's UV rays.

While it is true that maintaining a comfortable environment inside of the outdoor living space is essential, the needs for architects and builders go beyond that. They need to use designs and materials that are attractive. In addition to providing for the practicality of allowing for the ventilation of fresh air, those designs and materials must not detract from the décor of the building. Also, they shouldn't block beautiful, and often panoramic, views of the outdoors.

<sup>2</sup> Phantom Screens, Quality, Value & Functionality: Home Improvement Trends in 2014. An overview of North American homeowners' references during home renovations.



## PHANTOM'S RETRACTABLE SCREENS MEET THE NEED

Our motorized retractable screens for large openings are the perfect solutions for homeowners, architects, and builders.

For homeowners, our screens provide the exterior protection they need to expand their living space. Available with a variety of options, our mesh screens provide full ventilation, shading from the sun, protection from UV rays, a barrier against insects, and enhanced privacy.

According to independent scientific studies, our screens also offer the additional benefit of keeping the enclosed area cooler when it is hot outside while the home's air conditioner is turned on and warmer when it is cold outside.

Phantom's motorized retractable screens are constructed with professional-grade materials that complement the design of any home. They also allow the homeowner to maintain their view of the outdoors. Whether the choice is mesh or clear vinyl, beautiful views are never blocked because the screens retract completely out of sight when not in use.

Our motorized screens maintain the attractiveness of the décor by blending in with the surrounding frame of the opening. This is true whether they are recessed or mounted on existing structures.

Still, there is one area where our screens really stand out: improving energy efficiency throughout the entire living space. We conducted two studies to prove this important and valuable benefit.

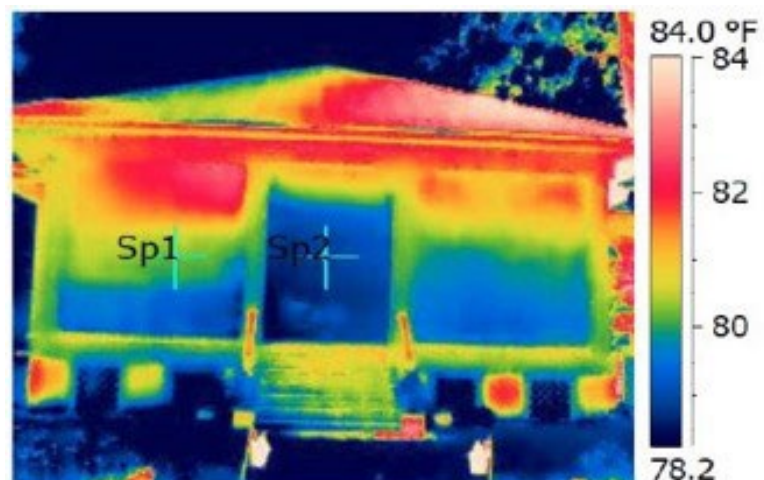
## PHANTOM SCREENS FIELD STUDIES

We retained Two Trails, an independent sustainable building consultant and verifier, to complete an infrared survey of two homes located in significantly different climates in the United States. The goal was to identify areas of heat loss, both with and without the benefit of Phantom products.

### Understanding Building Infrared Imagery

Two Trails documented their findings with infrared thermograms using a FLIR T460 thermal imaging camera and other interior and exterior testing tools. Unlike photographs taken with a standard camera that captures visible light in the 0.4 to 0.7 micrometer wavelengths, photographs taken with a thermal imaging camera captures infrared wavelengths in the 3 to 5, or 8 to 14, micrometer range. Visible light that produces heat, and other relatively hot objects, are very evident in infrared images as a result of their infrared emission and not due to their visible light emission.

The purpose of any infrared thermography is to thermally map heat transfer presence at specific locations. As a rule, patterns in the image that are lighter in color are warmer, and patterns that are darker in color are cooler.



Infrared image from Phantom Screens Idea Home

## LAS VEGAS, NEVADA

### *Year-Round Outdoor Living in Cold Dry Climate*

Cutting-edge energy efficiency and stunning contemporary design were the keywords for the 2016 edition of The New American Home®, America's premier show home. The New American Home® is a real-world laboratory that demonstrates concepts, materials, designs, and construction techniques that can be replicated in housing built in any place and within any price range. The design, construction, and amenities are market-driven, and showcase the latest in innovative products for the future of homebuilding.

With the 2016 edition of The New American Home®, the designers wanted to create an outdoor living space that was usable year-round despite Las Vegas' colder winters that average 40° Fahrenheit and extremely hot summers that hover around 100° Fahrenheit. Phantom's motorized retractable screens with solar mesh were installed to keep in the warmth through winter and block out 100% UV rays from the sun in summer.

When the screens aren't in use, they retract into cavities designed above the openings with the touch of a button, completely hiding them from view. This feature ensures that the screens don't detract from the design of the home.



Infrared image from TNAH2016

We brought in Two Trails to help document conditions present with and without the benefit of our solar mesh screens during a cool Las Vegas night. Two Trails utilized infrared imaging, along with data loggers, to document conditions over a period of time. The infrared imagery shows the visual evidence of heat transfer while the data logger shows ambient conditions inside and outside of the screened room over time.

Two Trails reported the following conclusions:

- The use of Phantom screens with solar mesh, with no heat source in the outdoor living area, shows that the screens have a heat retention ability simply by reducing convective and radiant heat loss.
- The use of Phantom screens while heating an outdoor living space will likely heat the room too much and likely will require the heat source to be shut down. This reduced use will lower utility consumption and is considered a large benefit.
- The use of heaters alone without Phantom screens as seen in temperature data logs show how quickly heat loss occurs, and although the comfort will likely remain, the heaters will likely have to remain on continuous thus requiring more utility consumption.
- The use of Phantom screens reduces solar loading and UV on surfaces and, as a result, can extend the life of materials.



## MOBILE, ALABAMA

### *All Day Comfort in Hot Humid Environment*

The Phantom Screens Idea Home in Mobile, Alabama is a 1906, arts and crafts, single-floor bungalow that has a beautiful character. Therefore, the plan was not to destroy the southern charm. Instead, we were able to keep most of the original elements so it still feels like an old-world home but with all of the modern conveniences. And, of course, one of those modern conveniences are Phantom screens throughout the entire home. Everywhere you go throughout the home there is a Phantom screen on almost every opening.

One of the most important parts of the renovation was the back porch. As a part of the renovation, we installed both mesh and vinyl screens. This allows us to extend the living space into the back porch by essentially making it another room of the house.

The mesh screen enables us to bring the outside in during the cool summer days and nights. Occupants on the porch can feel like they are sitting outdoors, but without being disturbed by mosquitos and other flying insects.

During the hot summer days and nights, motorized screens with clear vinyl allow us to control the temperature of the outdoor living space without blocking the view of the outdoors. The screens are designed to keep cooler air indoors so the occupants can spend more time in the outdoor living space without being limited to only two seasons. Additionally, the vinyl screen options offer up to 100% UV protection. And, they protect the porch area from rain, wind, and debris.

We retained Two Trails to help document conditions present with the benefit of our Phantom retractable screen using clear vinyl during a warm and humid Southern Alabama day and night. Infrared imaging, along with data loggers, were utilized to document conditions over a period of 24 hours. The infrared imagery shows the visual evidence of heat transfer while the data logger shows ambient conditions inside and outside of screen room during the 24-hour period.



Two Trails reported the following conclusions:

- Thermal imaging shows the benefit of vinyl enclosures with respect to reduction of heat loss.
- While the home air conditioner was turned on, and only with natural convection from home to outdoor living area, the outdoor living area was able to maintain an average of more than 7 degrees cooler than outside air. The outdoor living was also able to maintain an average 9% reduction in humidity which was actually less than the 3% variance to inside of home.
- During the non-conditioned hours from 11:00 p.m. to 9:30 a.m. in morning, although the room appeared to almost equalize with exterior temperatures, the relative humidity was impressively held at 26% less than outside conditions. This shows a significant benefit of vinyl screens for maintaining a comfortable environment within outdoor living area.
- Over the period of 24 hours, with cooling and non-cooling cycles, the outdoor living area appeared to maintain an average of over 3 degrees cooler and over 16% reduction in humidity.

## CONCLUSION

Homeowners take great pride in their homes. And, surveys show that in recent years there has been a steady demand from homeowners to create outdoor living spaces that make their home look and feel better. This demand is more than a trend. It's an emerging way of life for the modern homeowner. However, creating an outdoor living space is one thing. Making that space comfortable all year round is quite another.

Forward thinking architects and builders who are responding to this demand, or driving the trend, understand that they must go beyond simply creating an attractive space. To truly satisfy the desire of homeowners, they must make the outdoor living space more comfortable and livable.

Phantom motorized retractable screens are the solution. That's because we offer mesh and vinyl screens that do more than preserve the beauty of the home. Our screens are designed to create comfortable outdoor living spaces.

To prove this point, we commissioned two independent field studies that show how well our motorized retractable screens keep outdoor living spaces comfortable in a cold dry climate as well as in a hot and humid climate. These studies show definitively that our retractable screens meet homeowner needs to control the temperature and humidity in the outdoor space.

Now is the time to create the ultimate outdoor living space. To learn more about Phantom motorized retractable screens visit [PhantomScreens.com](http://PhantomScreens.com).



## ABOUT TWO TRAILS

Founded in 2001 with the goal of changing the methodology of conventional building science, Two Trails has become a leading resource for knowledge on how to implement healthy, sustainable projects.

Two Trails provides sustainable consulting services throughout the United States for commercial, residential and developments seeking to obtain LEED certification and/or LEED commissioning by USGBC (U.S. Green Building Council), ICC 700 National Green Building Standard (NGBS), Energy Star by the U.S. Department of Energy, and Florida Green Building Coalition (FGBC) certifications.



## ABOUT PHANTOM SCREENS

Phantom Screens® is North America's leading provider of retractable screens. Phantom's screens offer insect protection, solar shading and enhanced privacy for doorways, windows, and large openings such as outdoor living spaces, and lift & slide door systems. Phantom retractable screens are designed to pull or lower into place when required and retract out of sight when not in use.

Since its beginning in 1992, the Phantom brand has been synonymous with quality, innovative product development, and superior customer service. According to independent market research, 97% of Phantom customers rate their overall Phantom experience from good to outstanding.

Phantom Screens is a Registered Provider with the American Institute of Architects Continuing Education System (AIA/CES), AIBD, and a member of the NAHB's Leading Supplier Council.