

FLORIDA ENERGY CONSERVATION ASSISTANCE PROGRAM

ENERGY MEASUREMENT SERVICES DIVISION

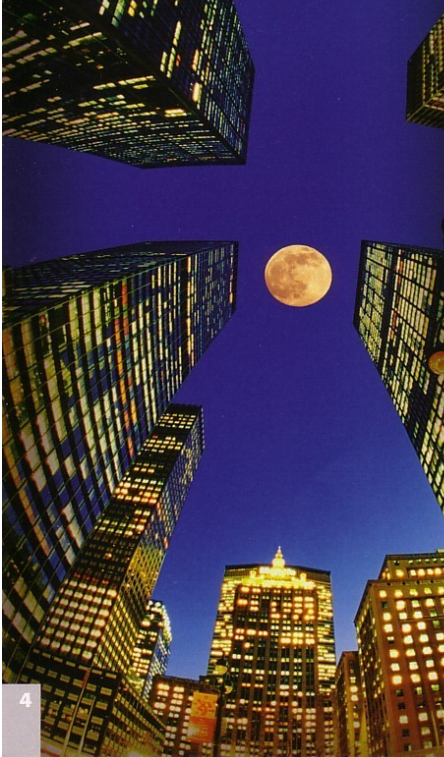


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**SPECIAL REPORT**

**THE WINSULATOR**  
INTERIOR STORM WINDOWS  
RETROFIT



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PREPARED BY



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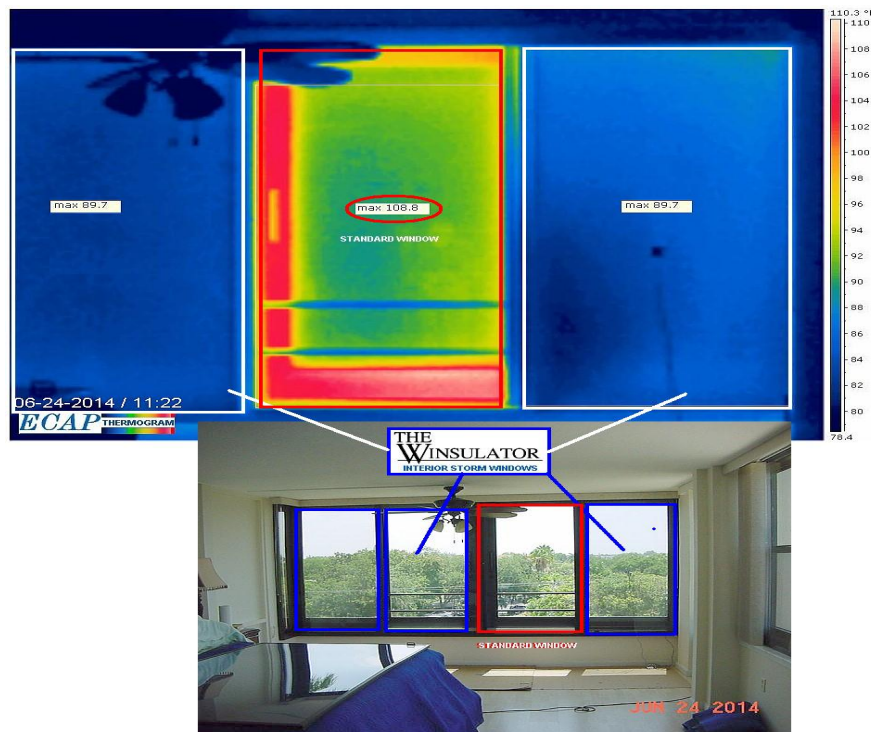
Wayne and Mary Ellen Myers

## WINDOW LOAD ANALYSIS EMBASSY HOUSE CONDOMINIUMS

On June 24<sup>th</sup> 2014 a measurement and verification load analysis, in accordance with ECAP-MVP-006 was conducted at the above facility to determine the effectiveness of; THE WINSULATOR INTERIOR STORM WINDOW as a retrofit over the existing fenestration system. In all 780 data points were simultaneously collected and analyzed, this includes a full Thermographic and Acoustic analysis to verify the products performance as an effective Energy Conservation Measure (ECM) and external noise reducer over the existing, as installed, system.

### Executive Summary;

As noted, in the Thermographic Analysis below, *The Winsulator System* met all of its manufactures published standards and was increasing, *the encapsulated windows*, combined (U-Factor/SHGC/Air Leakage/CR ) window energy performance ratings, by **42%** (280 BTU/SF/HR) while reducing street noise infiltration by 80%. This was accomplished with no negative effect on Visual Transmittance or the buildings original Architectural Aesthetics.



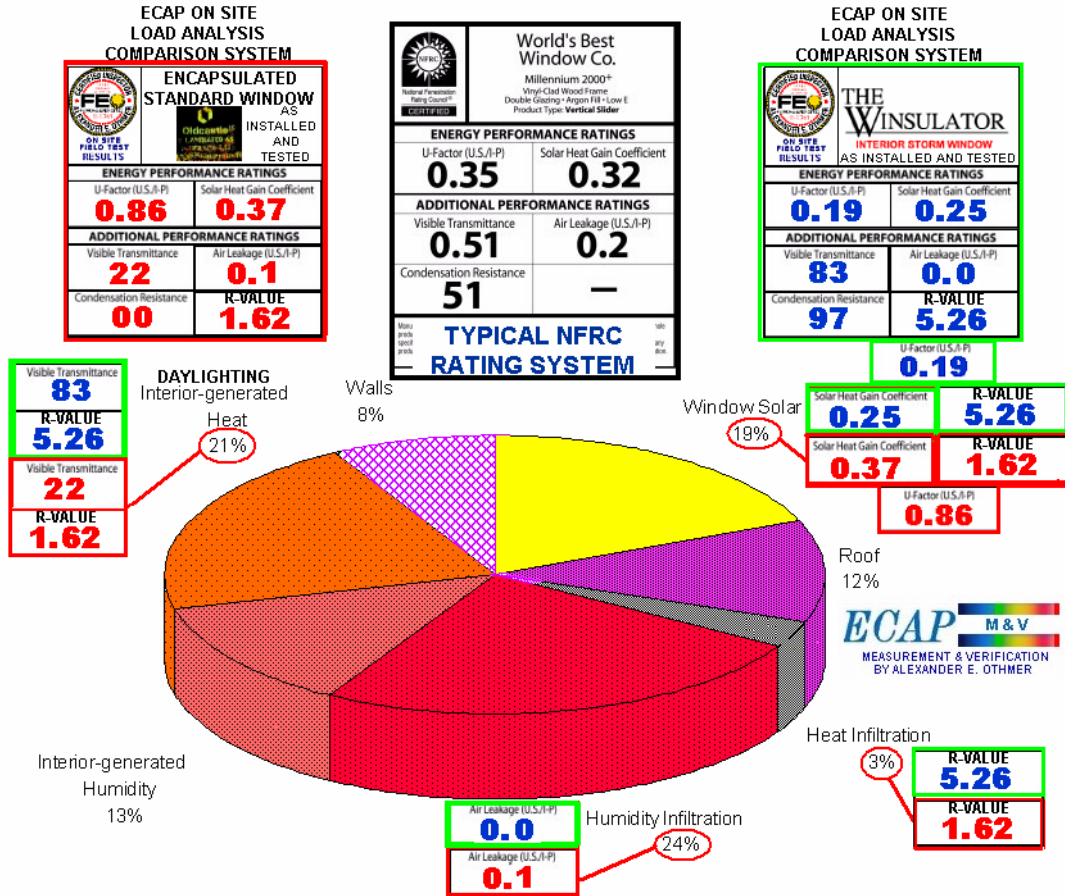


**Typical Window Energy Related Loads Analyzed;**

As the focus of this survey is to establish the value of the **Winsulator Interior Storm Window System** as an effective **Energy Conservation Measure ( ECM )**, all factors were considered including it's application as a **Daylighting Retrofit** for additional points applicable to Green Building Design Programs (Energy-Star & LEED etc.) .

REF.1 TYPICAL DATA COMPILED FROM IMPACT RESISTANT DADE COUNTY APPROVED GLAZING SYSTEMS;

**TYPICAL FLORIDA AIR CONDITIONING LOAD FACTORS**

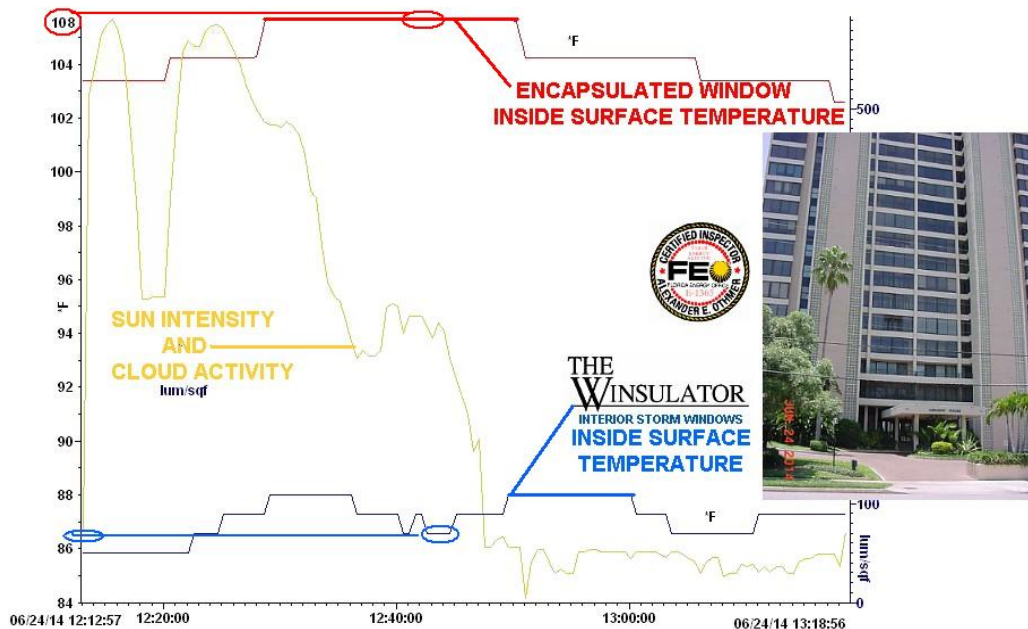


**Precision and Bias:**

All testing was in compliance with ASTM/ANSI standards using the buildings controlled zones as a *modified climatic chamber*. The outside ambient atmosphere (sun, moisture, barometric pressure and wind velocity) were used to generate our *differential sources*. The harmonious effect, of all the data collected during the test period was used to reach the following published conclusions. Reference Documents ASTM/ANSI / C-167 / C-168 / C-177 / C-518 / C-236 / C-519 / C-687 / C-976 / C-1045 / C-1132 / E-230 / E-961 / E-1105 / D-2126 / E-543 / E 547-93 / E-730 / E-283.

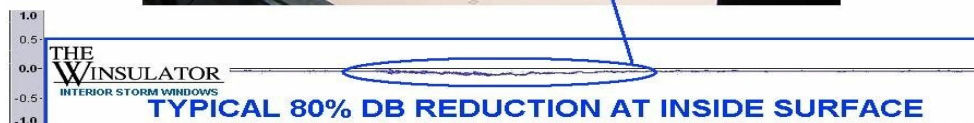
**SURVEY RESULTS:**

Typical **CENTER OF GLASS (COG)** data collection points;

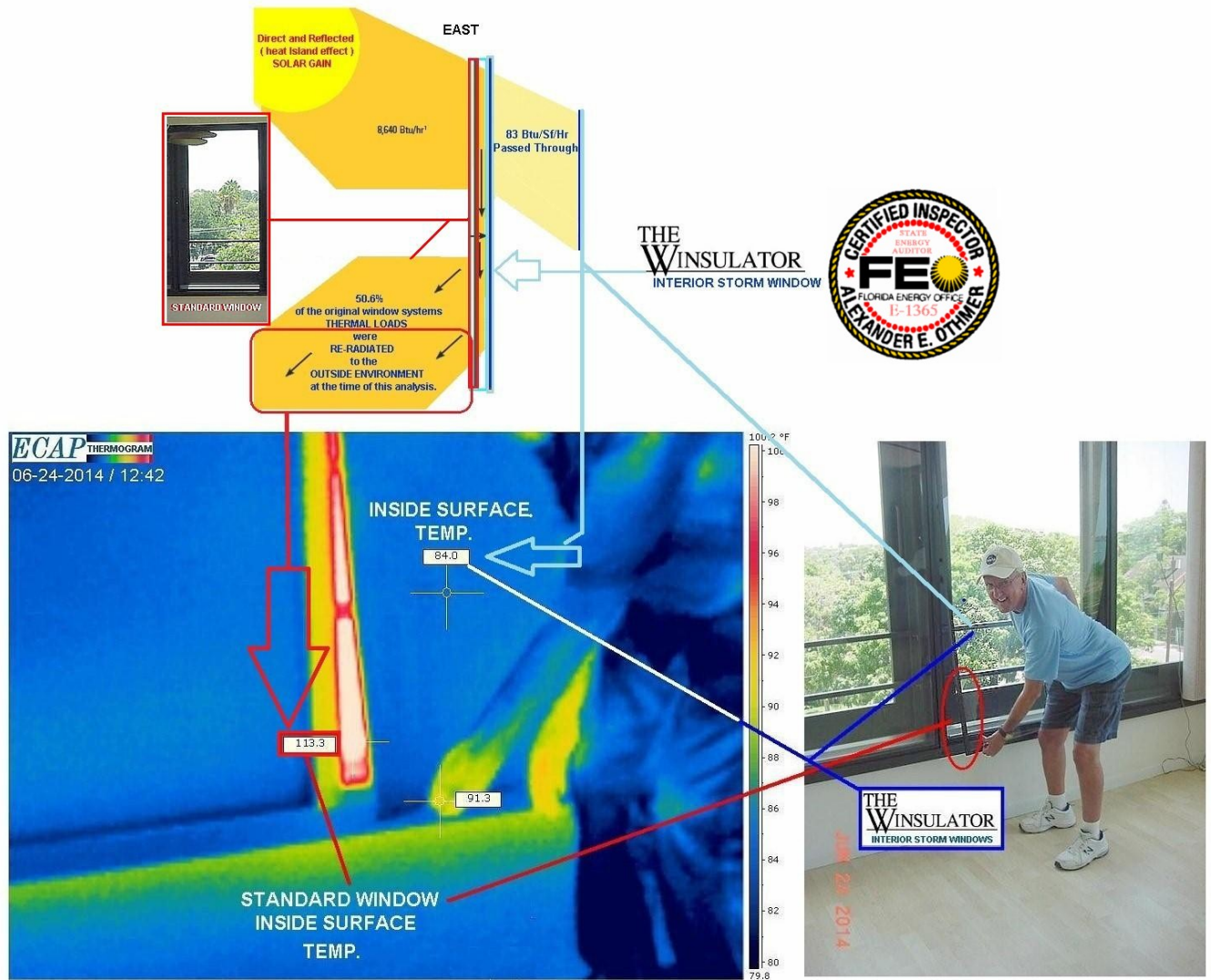


**CHART -1**

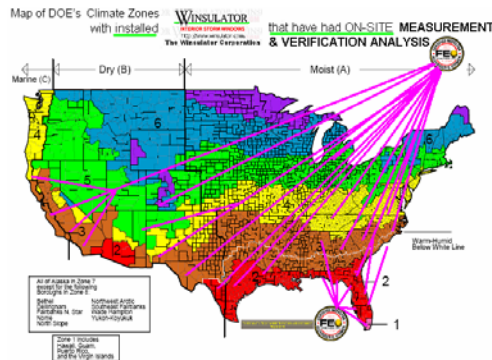
As noted in Chart-1, the system was clearly reducing the Window Related HVAC loads, **in both directions**, on the Standard Window it was installed over. The maximum Thermal Load Rejection was **30° F** from direct Solar Gain. The average Thermal Load Rejection from indirect heat sources (reflected solar gain & urban heat island effects etc.) was 18 to 29° F over the test period. Significant reductions in Street related noise was also apparent inside the living areas during the test period.



Typical product SHGC performance curves at this installation:

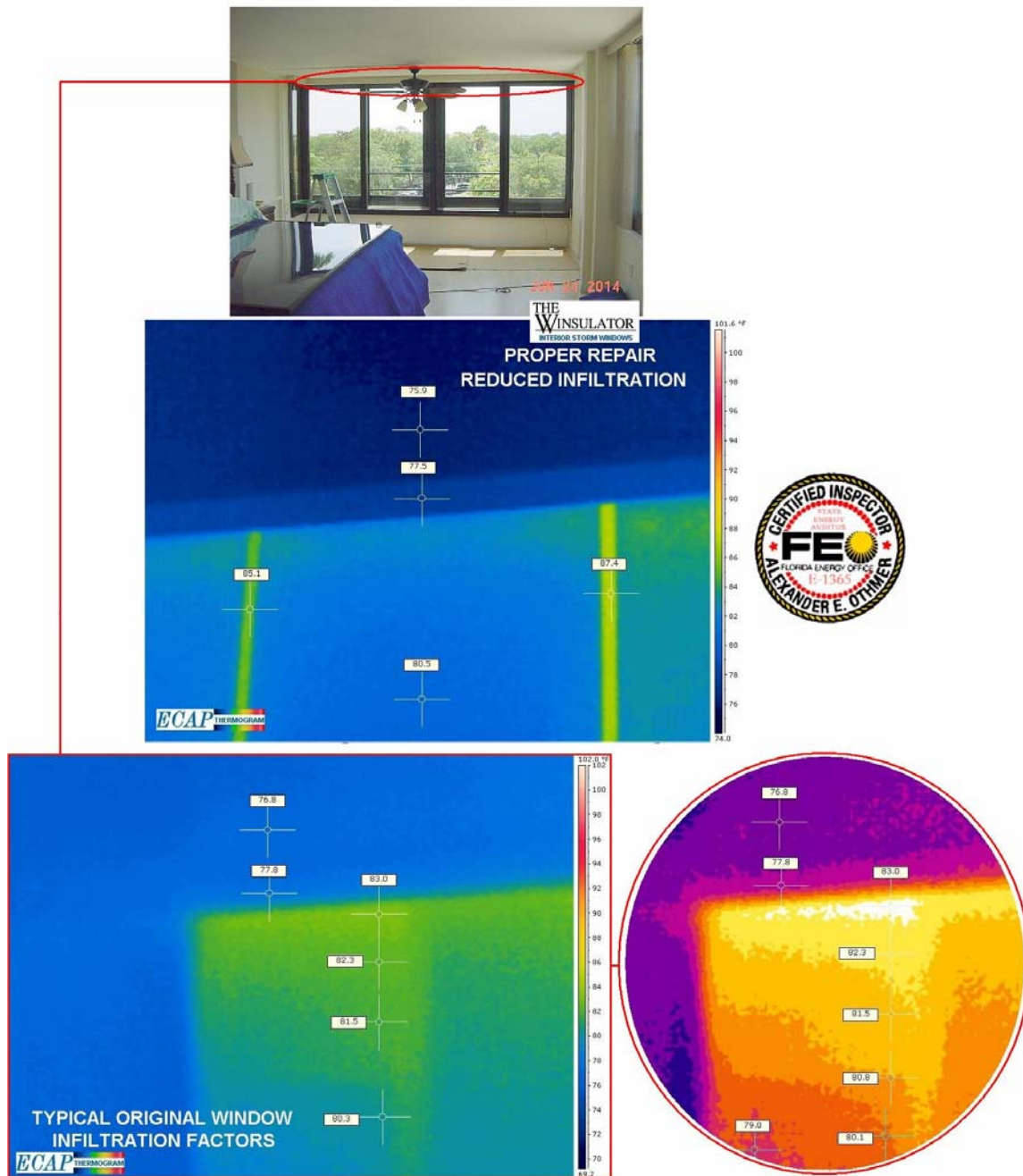


This survey's results concurred, within +/- 4%, with similar performance data curves, collected on the same system, installed in all DOE energy climate zones attesting to the systems value as a **ECM** that provides repeatable results due to it's unique engineering design.



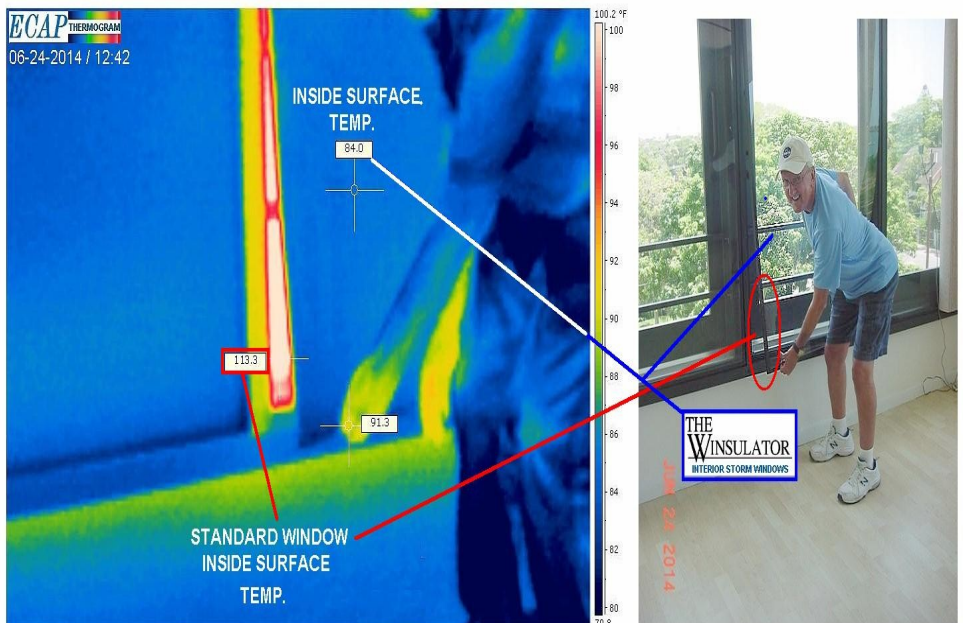


## Resistance to Infiltration Factors:



The Thermal Analysis (above) shows the effectiveness of **The Winsulator's** magnetic seal system. The seal system, in conjunction with the air gap created between the original Glazing Surface and inside Window Frame, create an **Infiltration Factor Barrier**. This barrier produced recordable load reduction results in Air Leakage, Heat Infiltration and Humidity Infiltration factors in this condominium unit.

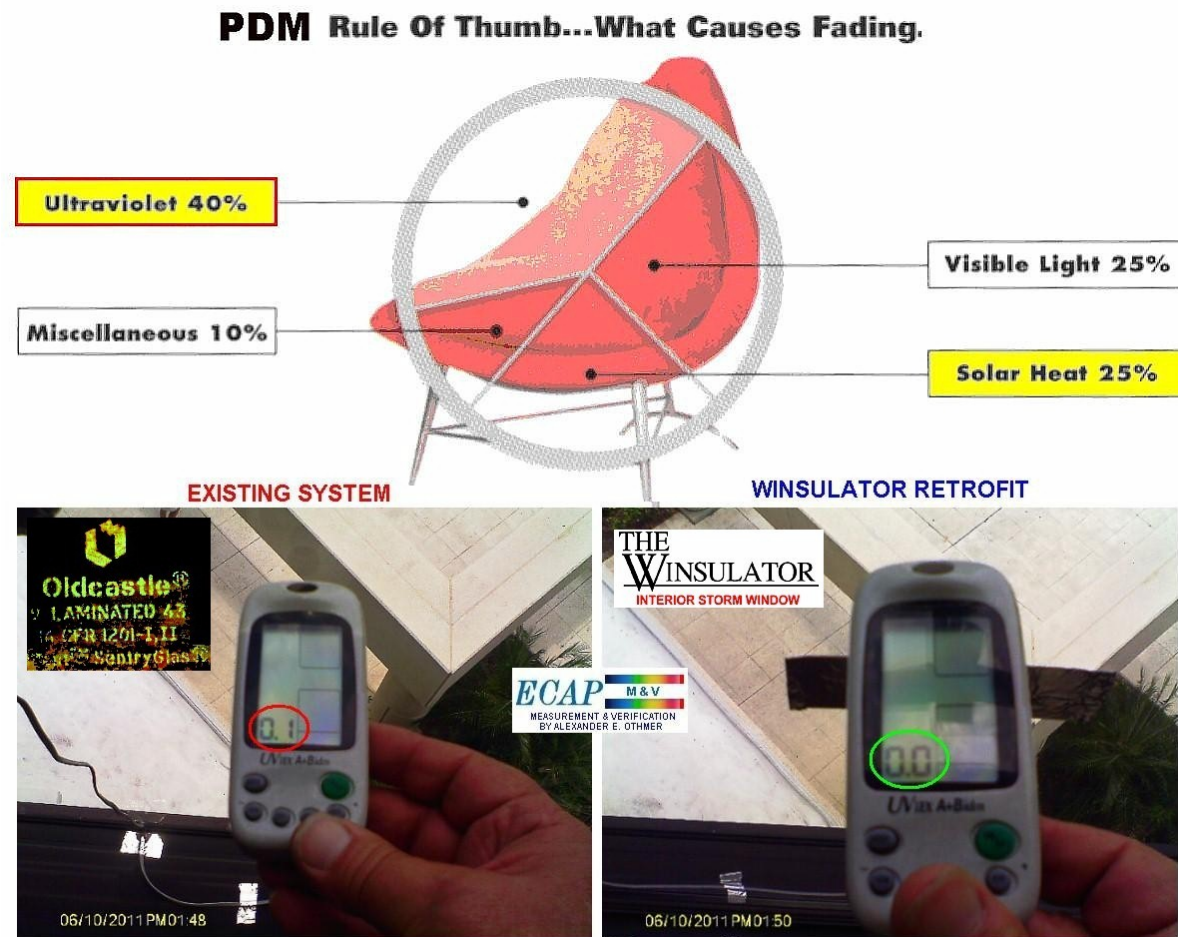
**Application as a DAYLIGHTING Retrofit;**



As noted above the need to close the blinds to reduce Solar Heat Gain or Street Noise is has been significantly reduced during Daylight Hours.

## Painting Maintenance & Decorating;

As installed, the Winsulator System was reducing future PDM cost as can be seen in the typical Ultraviolet Transmittance Analysis Results below;

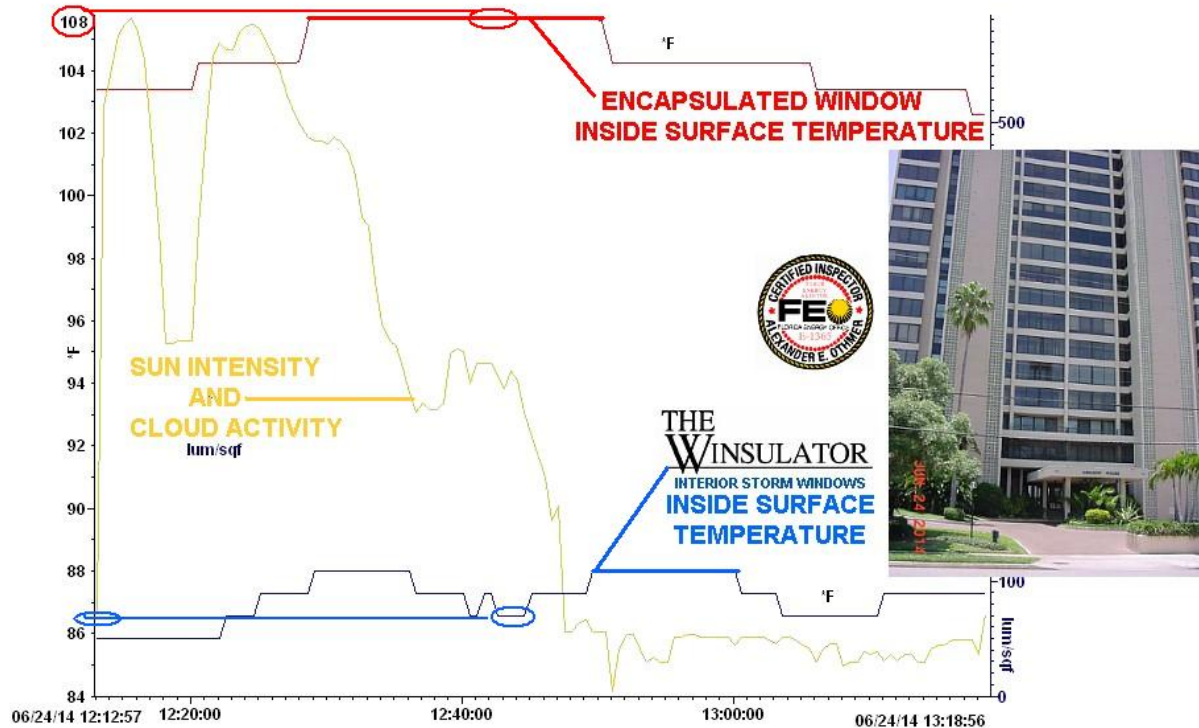


While the original Glass Windows were effectively blocking harmful **UV-Rays**, they were not as effective as the **Winsulator Retrofitted Window** in reducing UV or rejecting **the Solar Heat Gain Factors** that also contribute to fading that affects the service life of fabric, carpet and furniture finishes.



## SITE SPECIFIC CONDITIONS:

As noted in the data below the test windows were located on the East side of the building, for that reason I would consider that our results are likely **conservative at best**,



## Conclusion and Closing Comments:

After applying every criterion for evaluating Installed Fenestration Systems and incorporating the blended method of combining all the recorded analysis data pertaining to/and including U-Factor / R-Value / SHGC / Air Leakage / Condensation Resistance / Combined Center, Edge, Frame BTU transfer and factoring in Daylighting Properties,



**East facing Retrofit, was increasing the original fenestration systems Energy Performance Rating** by an average of **42%** (280 BTU/SF/HR) in both directions at the time of our analysis.

Additionally the system Reduced Interior Noise Infiltration by at least **50%** in most cases related to passing Car and Truck street traffic at the time of this analysis.

While we fully understand the limitations of some fenestration modeling programs to simulate a ***Glazing Retrofit System*** that consists of a clear, high monocular weight acrylic window pane, installed with a 3 inch dead air space between it and the original glazing, and encapsulating the opening with a magnetically sealed vinyl frame, that has a minimum of 5 Thermal Breaks, the ***Real Time Data*** reported on this ***As Installed Retrofit, under Real Time Weather Conditions in a 100% Occupied Building*** is as accurate as scientifically possible.

The fact that the **Manufacturer of the Winsulator System** was willing to offer this type of in-depth analysis on the product, at no cost to the customer should speak for itself.

Respectfully, for your consideration and review,



**Alexander E. Othmer CEA / CBA / NDE III**  
**Dir. Florida Energy Conservation Assistance Program**

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