

CASE STUDY

PPG SUNGATE® 1000 SOLAR CONTROL LOW-E GLASS

WINDWOOD HILLS PROJECT LAKELAND, FLORIDA (FLORIDA SOLAR ENERGY CENTER)

PROJECT OVERVIEW

- In 1997, two 2,425 square foot single-family homes were constructed with identical floor plans and compass orientations in Lakeland, FL. The Advanced home utilized many super-efficient, energy-saving products. The Control home was constructed with basic products and techniques that are representative of current residential building practices in Central Florida.
- Long-term energy monitoring was conducted on both homes to identify peak and average summer cooling demands, interior unoccupied temperature levels, etc.
- This project and the resultant monitoring was coordinated and managed by the Florida Solar Energy Center (FSEC).

KEY CONSTRUCTION DIFFERENCES

Control Home

- Aluminum-framed windows with single-pane clear glass
- R-30 ceiling insulation and R-6 ducts located in attic
- R-4 wall insulation in interior of concrete block walls
- 4-ton Trane heat pump
- Standard appliances (electric range, refrigerator, electric dryer)
- Standard incandescent lighting (30 recessed can lights)

Advanced Home

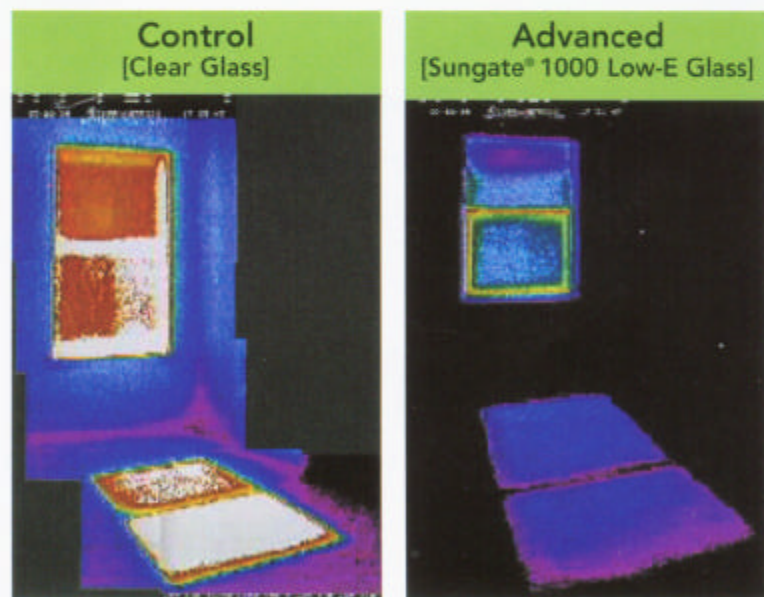
- Vinyl windows with insulating glass units featuring PPG Sungate® 1000 Solar Control Low-E glass
- Exterior insulation over concrete block system (R-10)
- White reflective roof with R-30 ceiling insulation
- Roof-mounted, photovoltaic solar electric array
- Sealed duct system within conditioned space
- Downsized variable speed air conditioner with field-verified cooling coil air flow
- Programmable thermostat
- High efficiency refrigerator and fluorescent lighting

RESEARCH FINDINGS

- Overall total energy consumption for the Advanced home during the monitoring period was 63% less than the Control home.
- Overall cooling demand for the Advanced home was 70% less than the Control home.
- The energy-efficient windows using PPG Sungate® 1000 Solar Control Low-E glass provided an estimated 26% of the total reduction in cooling demands (loads) for the Advanced home. (See chart on reverse side.)



HEAT PHOTOGRAPHS (INFRARED THERMOGRAPHY)



Source: Final Report, FSEC

More Solar
Heat Transmitted

Heat Scale

Less Solar
Heat Transmitted

"We selected PPG Industries' Sungate® 1000 Solar Control Low-E glass product with Argon gas fill. The improved glass has major implications for the required size for the air conditioning system. With 384 square feet of

WINDWOOD HILLS PROJECT GLAZING COMPARISON

Control

(Single-Pane Clear Glass)



Visible Light Transmittance
90%



Solar Heat Gain Coefficient
0.85



U Value/R Value (Glass)
1.11/0.90

Advanced

(3/4" Insulating Glass Units with Sungate® 1000 Glass)



Visible Light Transmittance
73%



Solar Heat Gain Coefficient
0.39



U Value/R Value (Glass)
0.24/4.1

Appearance
Sungate® 1000 glass transmits high amounts of visible light

Summer Performance
Sungate® 1000 glass blocks 50% more of the sun's solar heat energy than the Control glass

Winter Performance
Sungate® 1000 glass provides substantially lower center-of-glass U-values (higher R-values), which improve thermal insulation performance

PPG INDUSTRIES, INC. COMPANY OVERVIEW

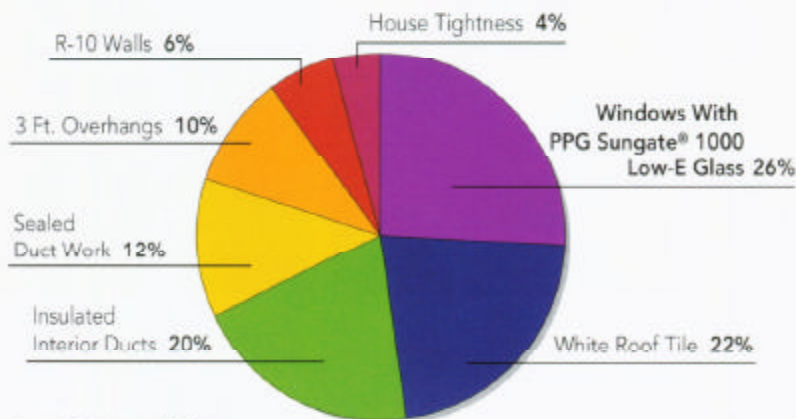
- ◆ First commercially successful U.S. glass company (1883)
- ◆ Major global supplier of Automotive, Aircraft, Residential and Commercial Glass Products
- ◆ Fortune 300 company

PPG SUNGATE® LOW-E GLASS OVERVIEW

- ◆ Sungate Low-E glass introduced in 1982
- ◆ Proven in millions of windows
- ◆ Sungate 1000 is the first PPG Low-E glass to offer significant solar control
- ◆ Provided nationally by leading window manufacturers

OVERALL COOLING DEMANDS (LOADS) FOR THE ADVANCED HOME WERE 70% LESS

SPECIFIC COMPONENTS ESTIMATED CONTRIBUTIONS:



Source: Final Report, FSEC

"In summary, the Lakeland project has conclusively shown that it is possible to construct homes in Central Florida which use only a fraction of the air conditioning of standard construction."

"Even during June's (1997) extreme heat wave, reduction in air conditioning use was over 70%..."

— Florida Solar Energy Center, Final Report

For more information on Sungate® 1000 Glass and where to purchase it, call 1-888-PPG-GLAS

Acknowledgements

Project Manager: Florida Solar Energy Center 407-438-1405	Project Sponsor: Sandia National Laboratories 505-844-1548	Builder: Rick Strawbridge Construction 941-646-9332	Window Manufacturer: VinylTech/PGT 941-493-4858	Glass Supplier: PPG Industries, Inc. 1-888-PPG-GLAS
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The intent of this brochure is to demonstrate the value of energy-saving PPG glass in residential homes. PPG makes no warranties, guarantees or representations with regard to the energy-saving potential of the product in residential homes.



Glass Technology
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