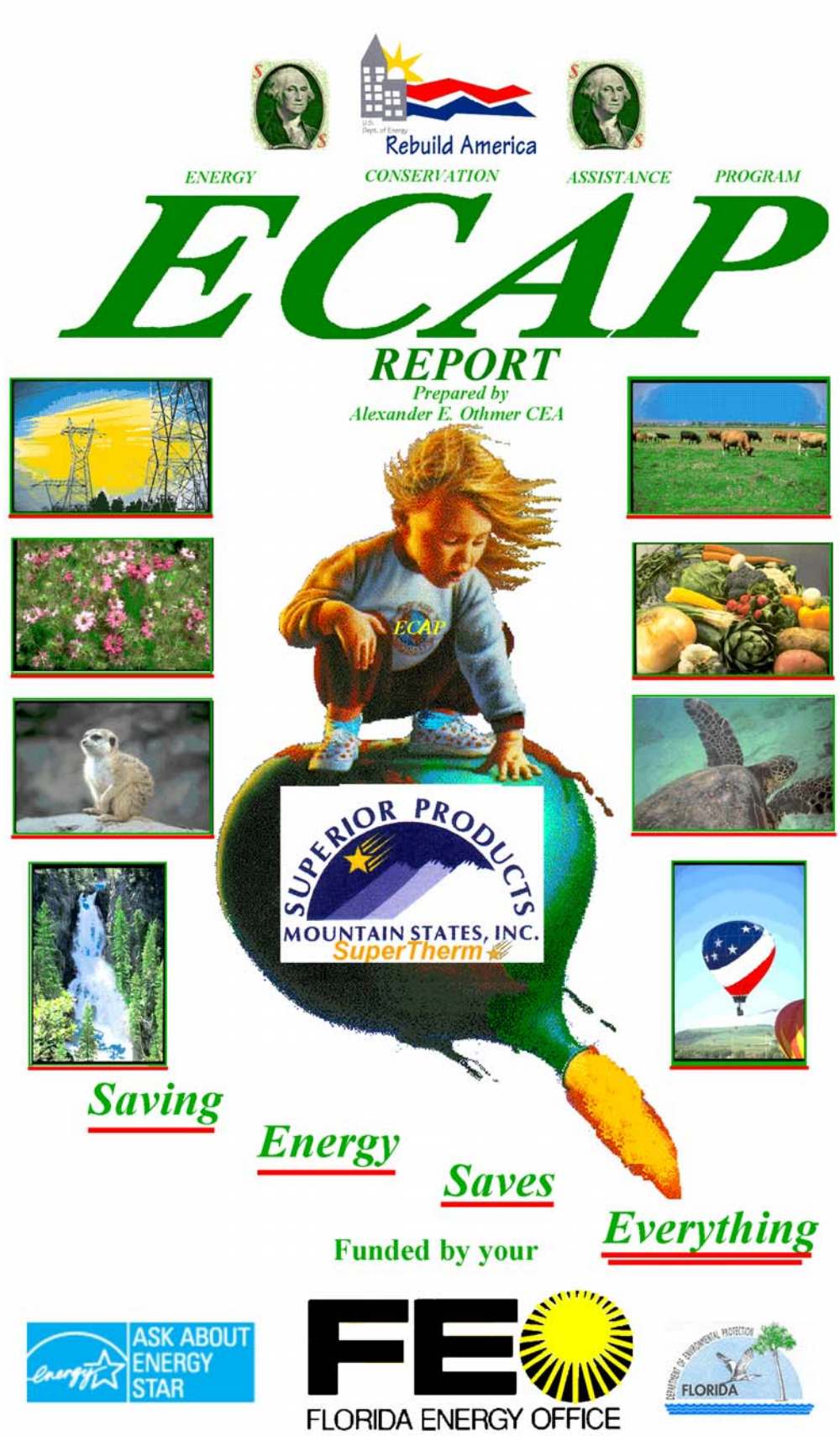
Rebuild America
ENERGY CONSERVATION ASSISTANCE PROGRAM
ECAP
REPORT
Prepared by
Alexander E. Othmer CEA
ECAP
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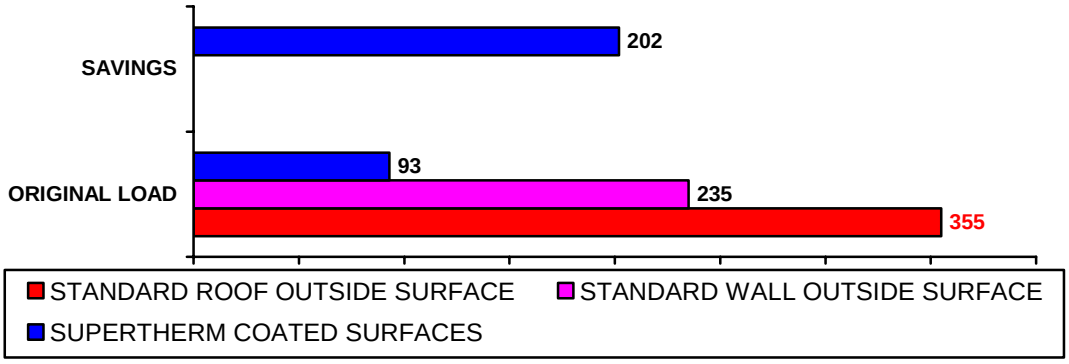
Superior Products Mountain States Inc.
Denver, Colorado

On July 19th & 20th 2004 at the request of Mr. Tom Higgins, a Measurement and Verification Analysis was conducted at the above facility in accordance with the **S**tate of **F**lorida **E**nergy **O**ffice / **ENERGY CONSERVATION ASSISTANCE PROGRAMS Designation: ECAP-CUL-1-03 Method for Comparing Utility Loads in Standard Constructed Buildings.** The objective of this analysis is to determine the impact of the ***"As Built Conditions and As Installed Components / Equipment"*** on the utility loads in occupied residential, commercial and government buildings. The focus of this procedure is to provide ***a comparison*** to known standards for all parties interested in using ***alternative energy devices*** to ***displaced conventional utility loads***. This report reflects the performance characteristics of the ***SuperTherm Coatings*****,** as applied to the test facilities external surfaces, as a possible passive ***E***nergy ***C***onservation ***M***easure ***(ECM)*** to reduce internal Energy Loads and reduce the Heat Island Effects caused by roofing systems in urban areas.

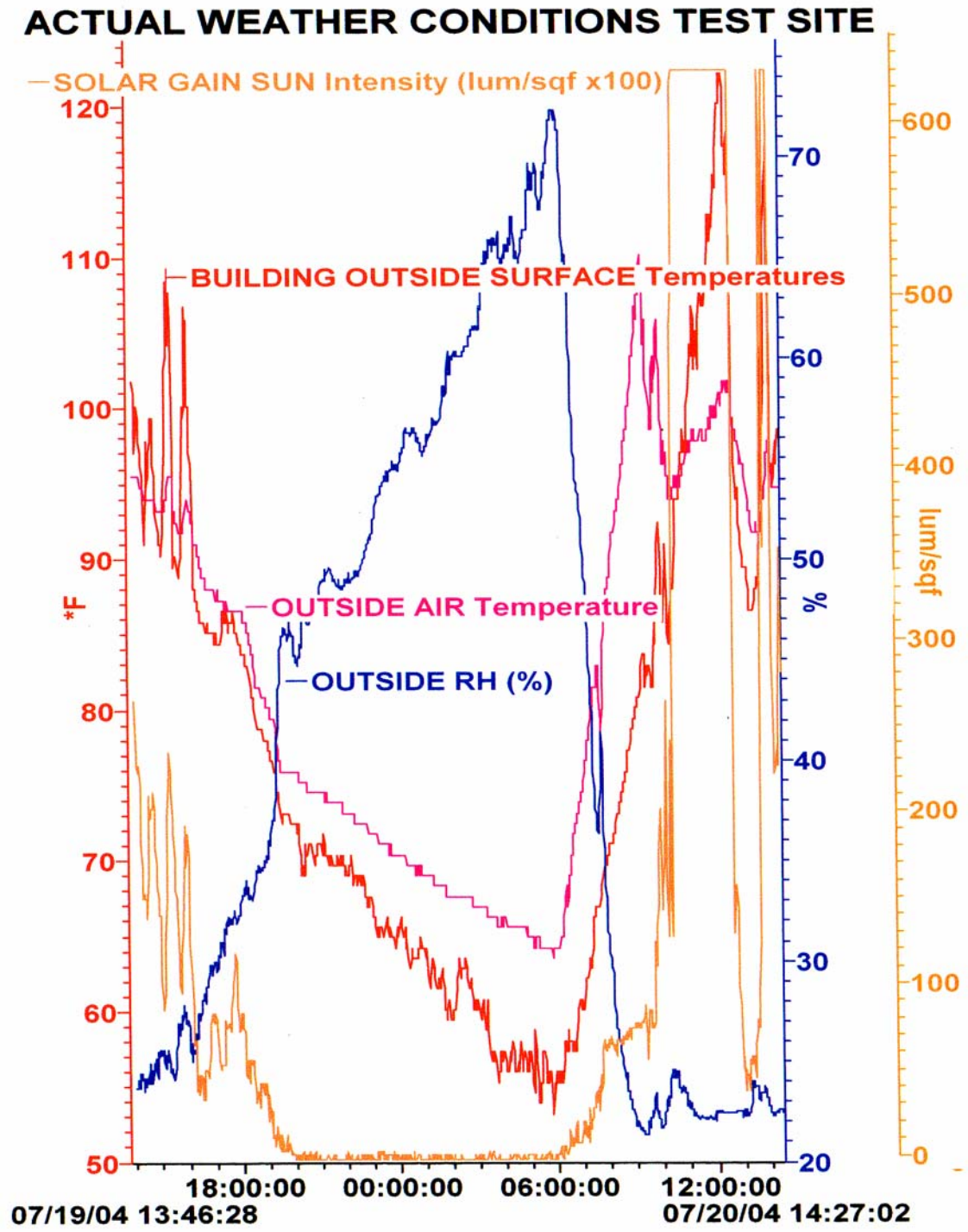
- Our survey indicated that the test specimen's building envelope related energy loads were reduced approximately **26 to 30%** by the use of this particular ***E***nergy ***C***onservation ***M***easure (***ECM ***). This was accomplished with no negative effect on the existing buildings Architectural Aesthetics.*** The chart below shows a synopsis of our findings**.**

AVERAGE THERMAL LOADS OF OUTSIDE BUILDING ENVELOPE SURFACES / BTU PER SQUARE FOOT PER HOUR



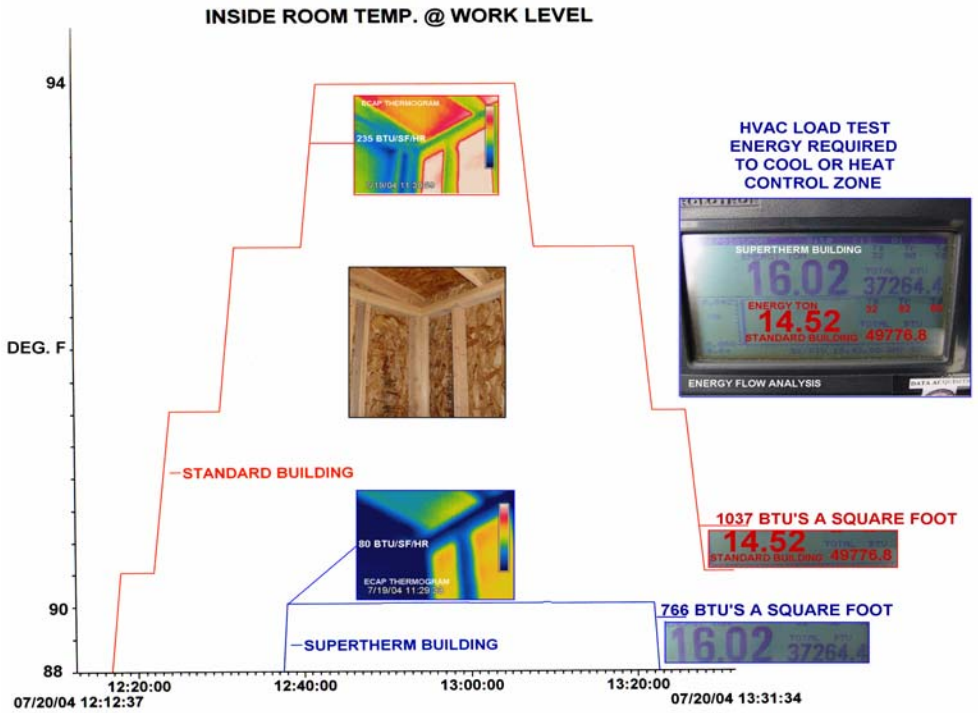
Average SITE Weather conditions during the analysis period were as follows:

High Temperature	110 Deg. F.
Low Temperature	65 Deg. F
Average Wind Speed	5.5 MPH
Average ***UV*** intensity	99 A+B
Average Outside Humidity	49.5%

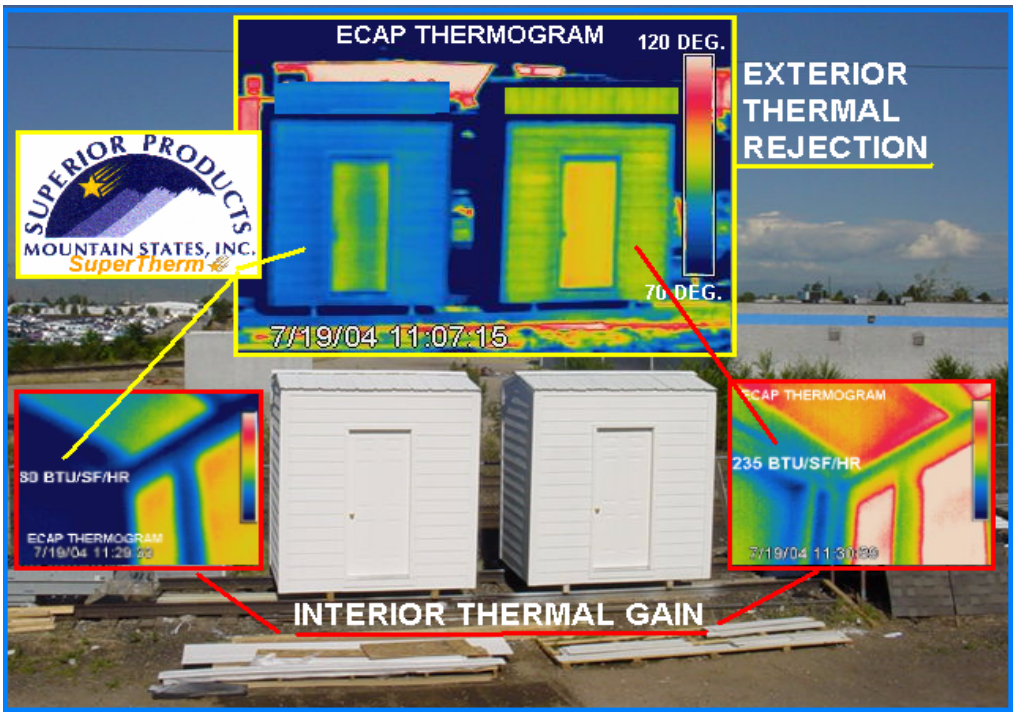


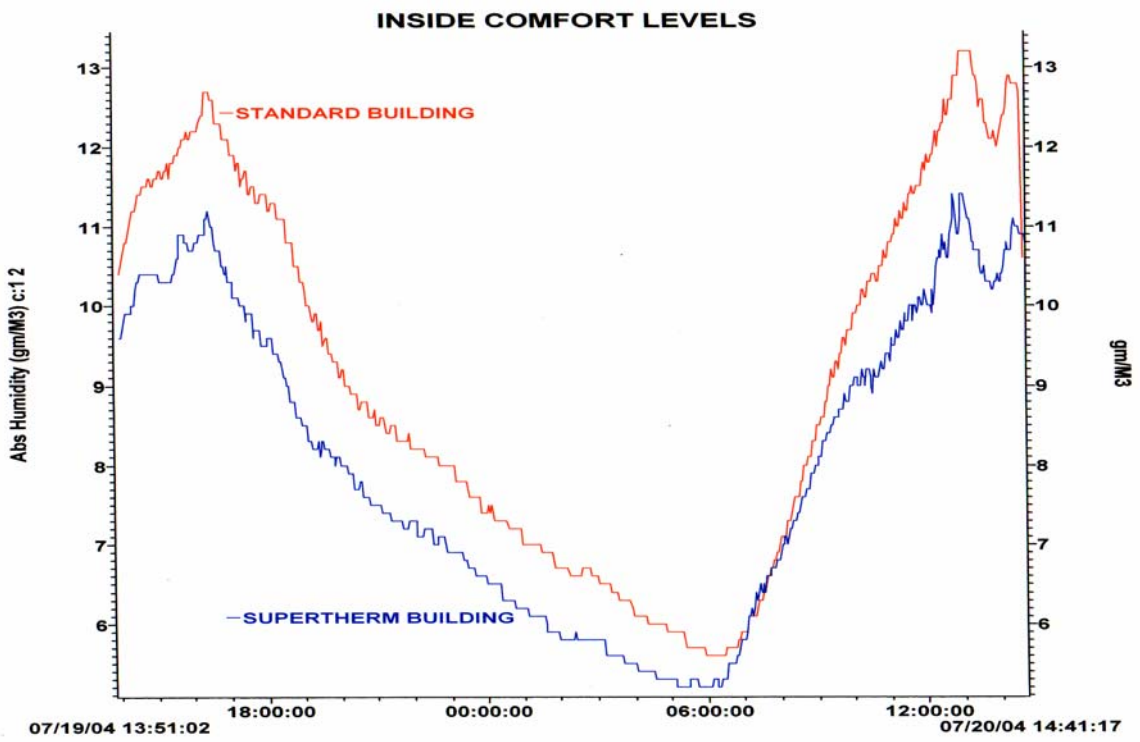
SYSTEMS TESTED

All load producing construction materials on both buildings were analyzed. 7,250 data points were recorded at 2 minute intervals for a 24 hour period with a synopsis of the findings as follows:

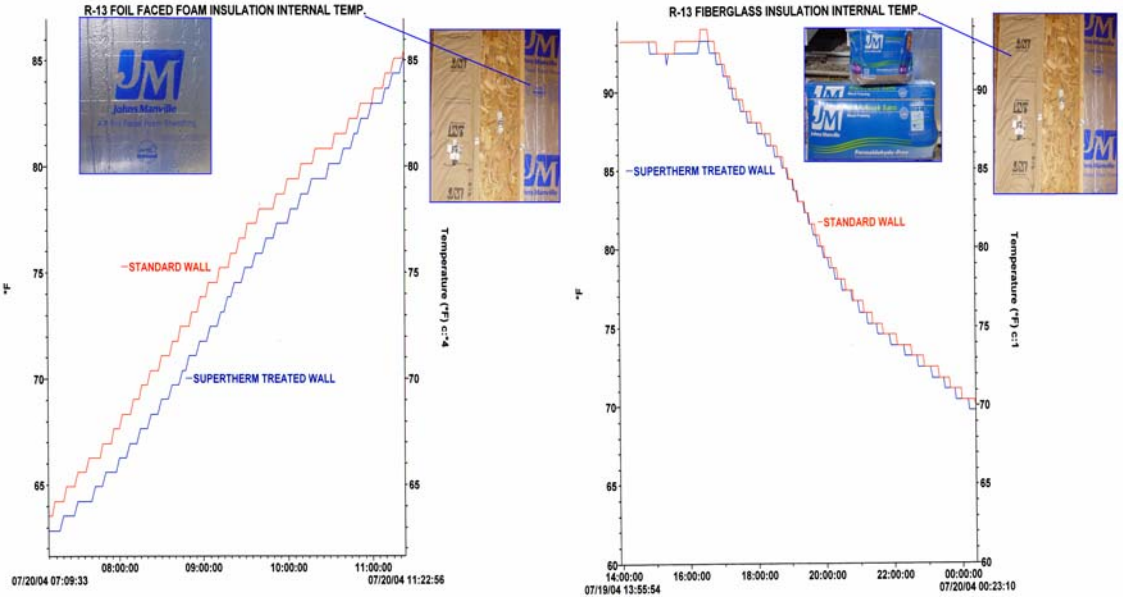


THE THERMAL ENERGY NECESSARY TO HEAT OR COOL THE BUILDING COATED WITH THE ***SUPERTHERM*** PRODUCT REQUIRED ***26% LESS ENERGY***.

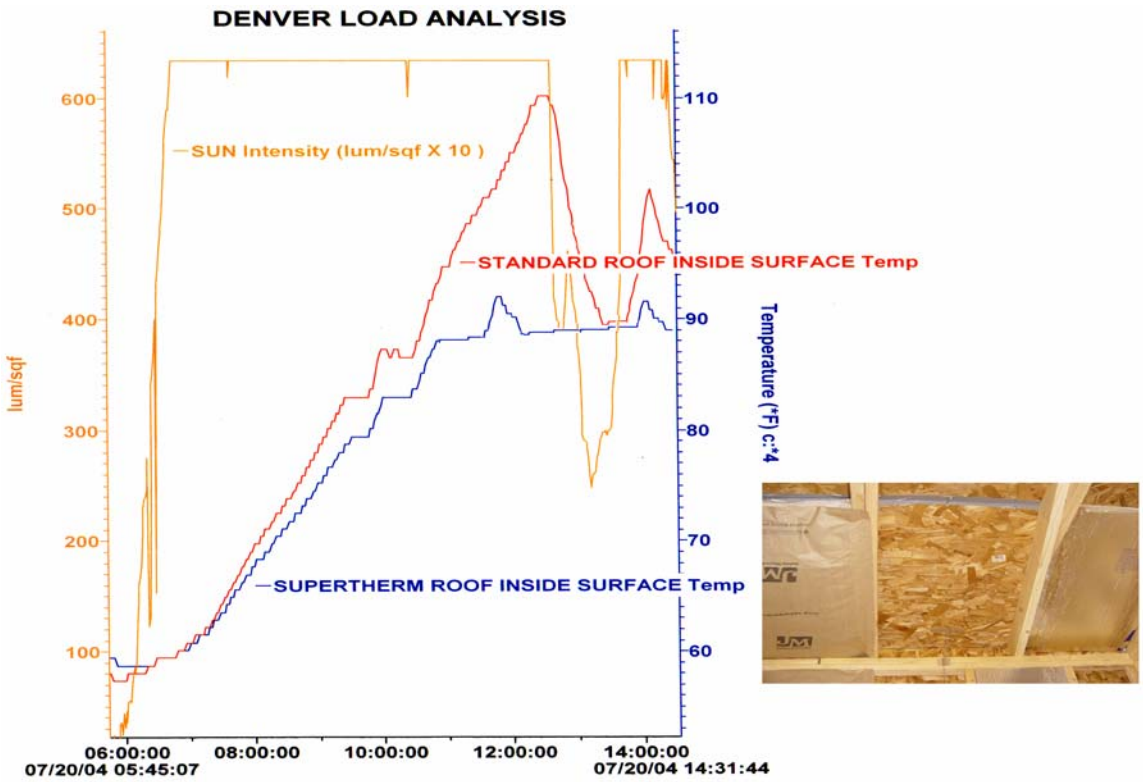




THE PERCENT OF MOISTURE INFILTRATION IN THE BUILDING COATED WITH THE ***SUPERTHERM*** PRODUCT WOULD REQUIRE ***LESS ENERGY*** TO MAINTAIN COMFORT LEVELS.



IN EVERY INSTANCE THE BUILDING COATED WITH THE ***SUPERTHERM*** PRODUCT ***ENHANCED THE PERFORMANCE*** OF STANDARD INSULATION PRODUCTS.



THESE PERFORMANCE ENHANCEMENT PROPERTIES WERE FOUND TO BE EQUALLY EFFECTIVE ON BOTH ROOF AND SIDE WALL APPLICATIONS.

Field Test Results

The location of the test specimens was adequate. Both buildings were of standard construction consisting of wood framing, standard OSB wall and roof sheeting's with a standard galvanized metal roof covering and James Hardey Board external wall coverings. The calculated R-Value of the uncoated existing materials was found to be approximately an R-2.45. The only difference between the two buildings consisting of approximately 48 square feet of control zone area was the external protective coatings.

One of the buildings was coated with a standard white latex paint while the other buildings roof and all external surfaces, including the front door had been coated with a white ***SUPERTHERM*** product. As noted and some of the test results on the prior pages of this report the differences created by the ***SUPERTHERM product*** concerning load reductions produced by thermal conduction, convection and absorption were significant. Additionally, significant reductions in moisture infiltration were also noted.

In every instance the Field test results concur with the manufacturers published data on the products anticipated performance curves obtained using in laboratory test methods.

Our Energy Flow analysis using a simulated water flow rate of approximately 6.5 gallons per minute indicated that the standard constructed building would require **a minimum of 1,037 BTU's of heating or cooling energy per square foot to maintain a minimal comfort level.**

In retrospect, the building coated with the ***SUPERTHERM product*** **reduce these loads to 766 BTU's of heating or cooling energy per square foot to maintain the same minimal comfort level.** This relates to a **26 to 30%** overall increase in energy efficiency depending on the percentage of direct solar gain.

The aforementioned Humidity infiltration reduction factors took place regardless of the amount of direct solar gain.

CLOSING COMMENTS

On behalf of the United States Department of Energy, The State of Florida Energy Office and the United States Environmental Protection Agency, let me thank you for your efforts to conserve Energy. We hope you will continue to promote ***ENERGY STAR BUILDINGS ALLY & REBUILD AMERICA BUSINESS PARTNER products*** to assist your clients reducing energy consumption and their related negative environmental impacts.

While on that subject, our office feels that particularly when addressing external building thermal loads, your product could significantly reduce the **Heat Island Effects** taking place in most urban areas. The photo and Thermogram below clearly show the benefits provided by your product in this arena.

This report is meant to be an educational guide to familiarize you ***with the historical performance curves of your chosen*** ***E***nergy ***C***onservation ***M***easures based on your supplied data and our field test results, it ***should not be construed as an endorsement of any product or service by name or specific design.***

Once again let me ***thank you*** for giving us the opportunity to use your facilities as a field test site. The data collected is a valuable asset to our program in building a comprehensive profiling of ***actual energy related loads*** that occur in ***occupied / operational buildings***. This type of data is critical to other Engineers facing decision making tasks, where published measurement and verification data is not yet available **or inaccurate**.

This is the second time we have had the pleasure to test your product, it is rare that a single product will show such Repeatable Results in two totally different environments, South Florida and Denver Colorado, a true testimonial to your products ***ENERGY STAR*** rating.

Please feel free to contact our offices if we can be of any assistance in helping you meet your future conservation / mitigation goals.

CEA/CBA/MCEIII

Dir. Florida Energy Office's / E C A P Program
University Of South Florida / Small Business Development Center