

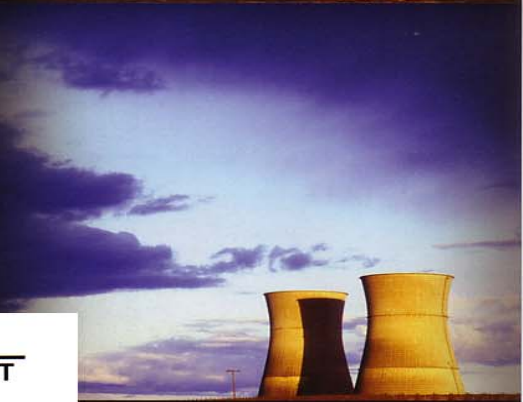


FLORIDA ENERGY CONSERVATION ASSISTANCE PROGRAM

ENERGY MEASUREMENT SERVICES DIVISION

**EMS FEMP**

**SPECIAL REPORT**

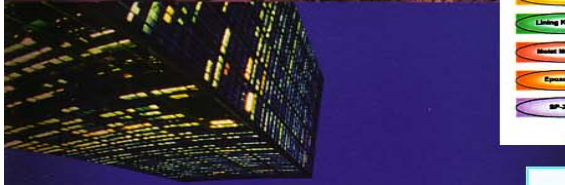


**SUPERIOR PRODUCTS INTERNATIONAL SOUTHWEST**

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**IFM Intermodal Facility & Maintenance, Inc.**

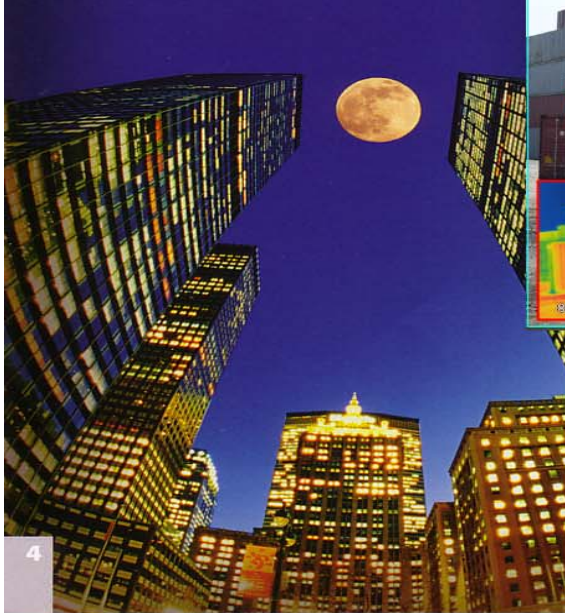
**TYPICAL STANDARD UNITS AS TESTED**

**TYPICAL SUPERTHERM UNITS AS TESTED**


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PREPARED BY

**THE MOST ABUNDANT SOURCE OF NEW ENERGY RESOURCES WE HAVE IS THE ENERGY WE CAN CONSERVE**

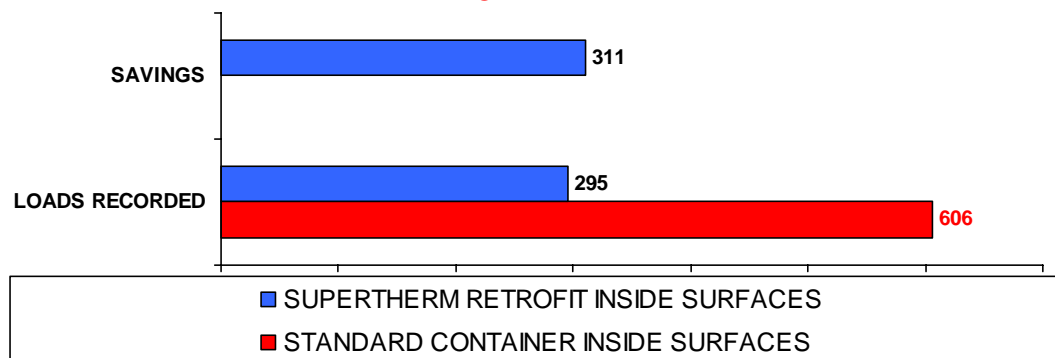




On August 23<sup>rd</sup> & 24<sup>th</sup> 2006 at the request of Mr. Bill Dwyer, in a cooperative effort instituted by Mr. Gordon Ginzel  *Intermodal Facility & Maintenance, Inc.* a Measurement and Verification Analysis was conducted at the above facility in accordance with the Florida **ENERGY CONSERVATION ASSISTANCE PROGRAMS Designation: ECAP-CUL-1-03 Method for Comparing Utility Loads in Structures and Buildings.** The objective of this analysis is to determine the impact of the "*As Built Conditions and As Installed Components / Equipment*" on the energy producing loads on occupied residential, commercial, government building and other structures. The focus of this procedure is to provide *a comparison* to known standards for all parties interested in using *alternative and conventional conservation products and devices to displaced energy loads*. This report reflects the performance characteristics of the **SUPER THERM COATING**, as applied to the structures external surfaces, as a possible passive **Energy Conservation Measure (ECM)** to reduce internal Energy Loads and reduce the Heat Island Effects caused by exposed surfaces in urban areas.

- Our data indicated that at the time of this survey the test specimen container inside surface *conduction related energy loads* were reduced approximately **46 to 52%** by applying **SUPER THERM** as an **Energy Conservation Measure (ECM)** to outside surfaces. The chart below shows a synopsis of our findings;

**AVERAGE THERMAL LOADS OF INSIDE CONTAINER  
 ENVELOPE SURFACES /  
 BTU PER SQUARE FOOT PER HOUR**



## **EXECUTIVE SUMMARY**

In all over 4,320 data points that were collected simultaneously over a 24 hour test period were analyzed.

### **TYPICAL STANDARD CONTAINER AS TESTED**



The container retrofitted with the ***SUPER THERM PRODUCT*** demonstrated reduced loads normally associated with Energy Consumption and Coating Maintenance as follows;

### **TYPICAL RETROFITTED *SUPER THERM* CONTAINER**



- INSIDE CONTAINER AMBIENT TEMPERATURE ***22 DEGREES COOLER***
- THERMAL CONDUCTANCE TO OUTSIDE ENVIRONMENT ***50% LESS***
- EXTERNAL SURFACE TEMPERATURE ***47 DEGREES COOLER***
- INTERNAL SURFACE TEMPERATURES ***37 DEGREES COOLER***
- OUTSIDE SURFACE REFLECTIVITY ***50% HIGHER***
- ULTRAVIOLET ABSORPTION RATE ***92% LESS***
- INTERNAL MOISTURE LEVELS ***28.5% DRYER***

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

High Temperature 97 Deg. F.  
 Low Temperature 74 Deg. F  
 Average Wind Speed 3 to 5.5 MPH  
 Average UV intensity 99 A+B

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 SUPER THERM  
 FIELD TEST RESULTS  
 RETROFITTED  
 SHIPPING CONTAINERS  
 AUGUST 2006**



**60%**



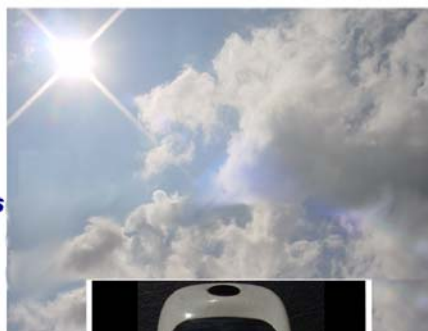
**31%**



**SOLAR GAIN REJECTED  
 SUPERTHERM UNIT**

**SOLAR GAIN REJECTED  
 STANDARD UNIT**

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 SUPER THERM  
 FIELD TEST RESULTS  
 RETROFITTED  
 SHIPPING CONTAINERS  
 AUGUST 2006**



**0.5**



**6.2**

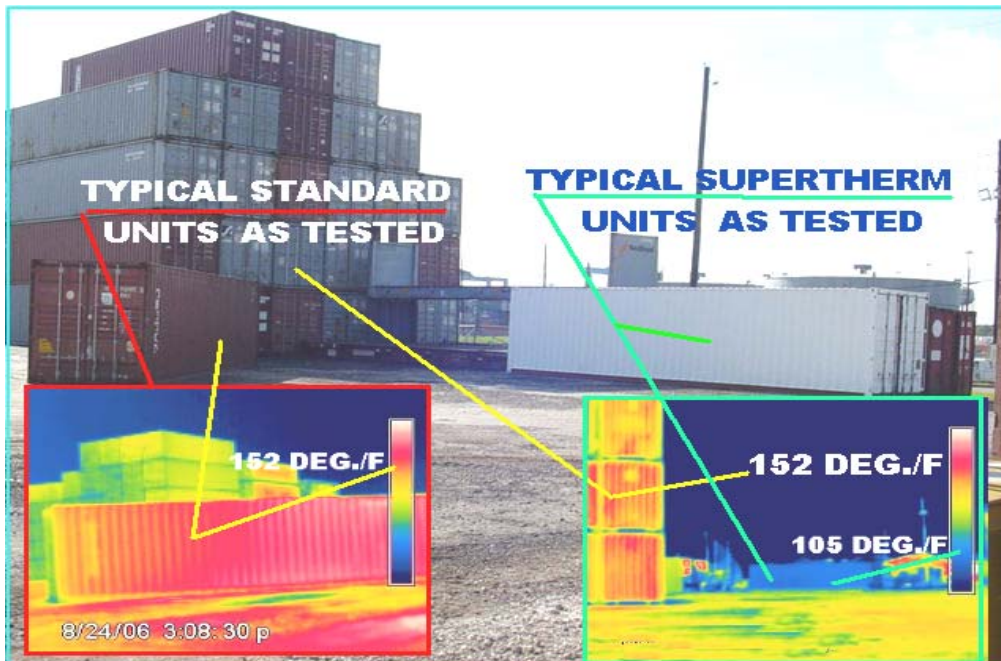
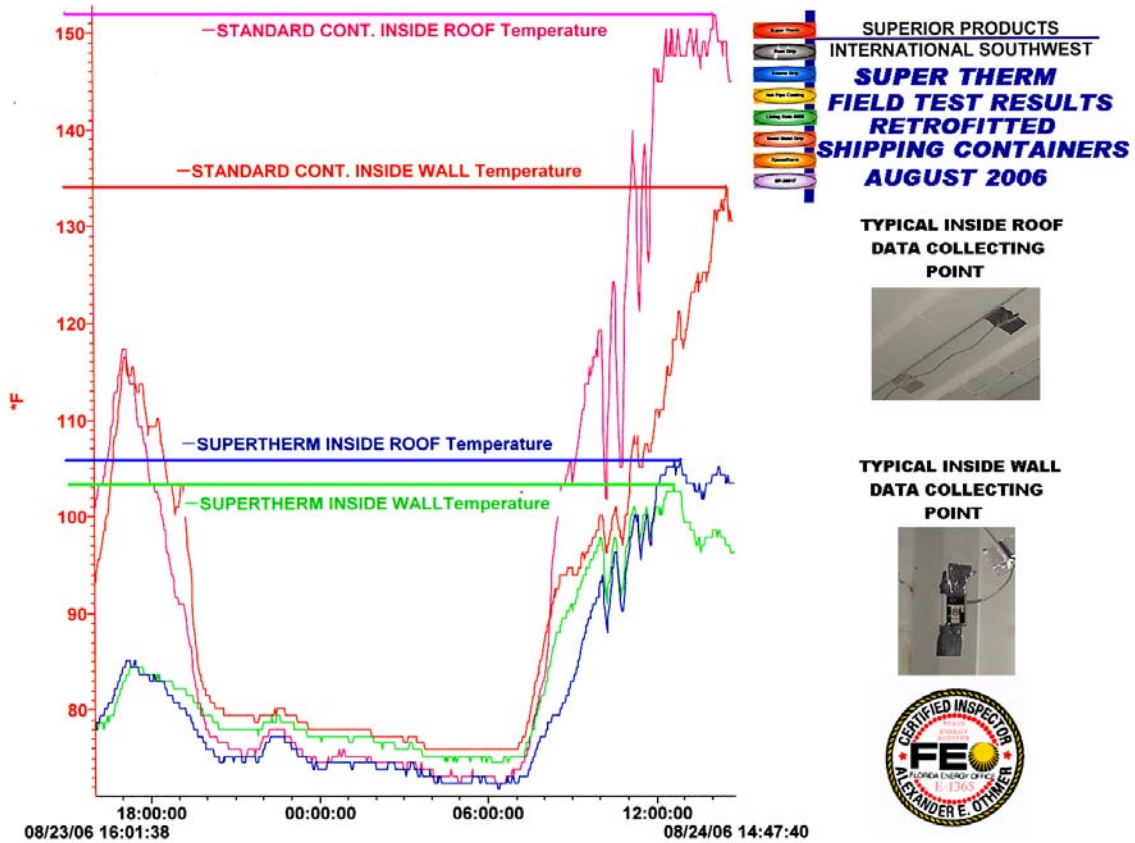


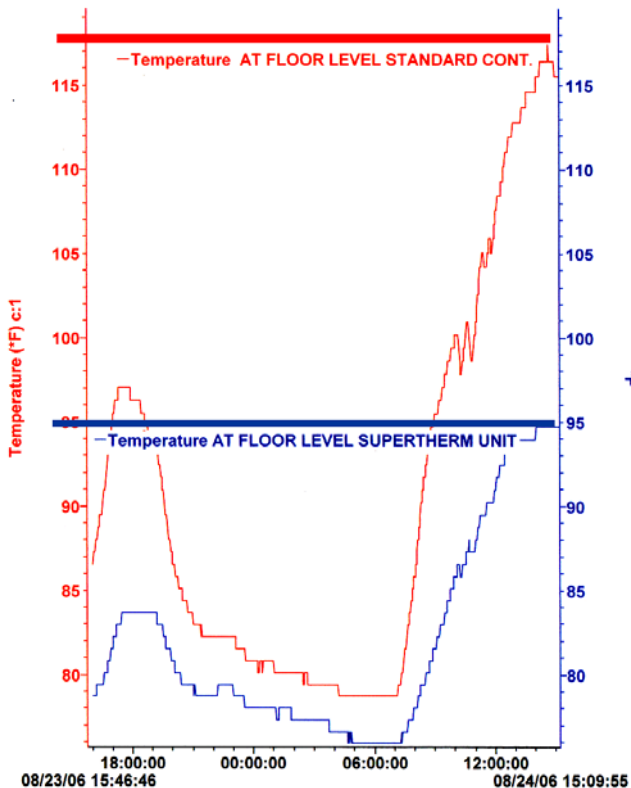
**SUPERTHERM COATING  
 RETROFITTED UNIT**

**STANDARD COATING  
 STANDARD UNIT**

**SYSTEMS TESTED**

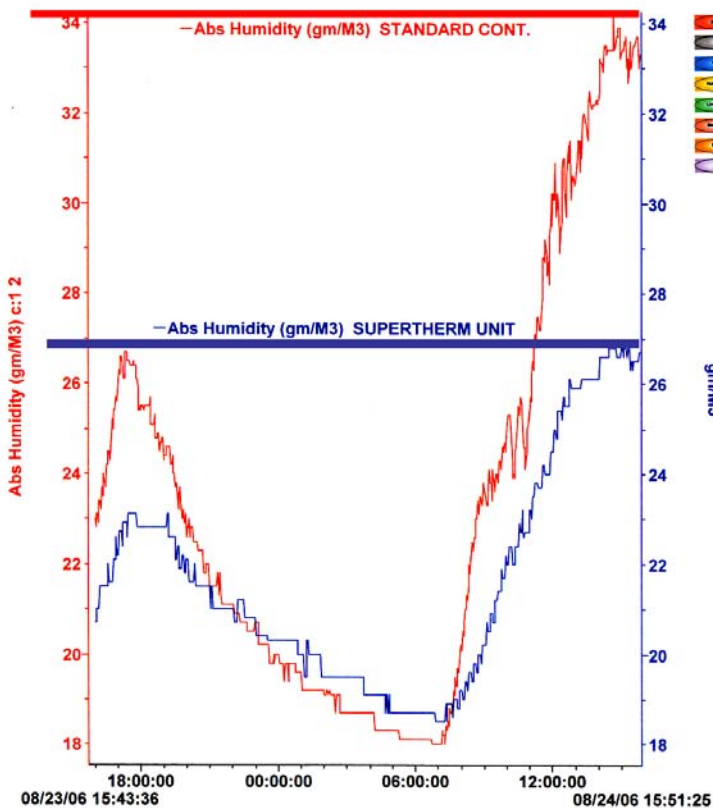
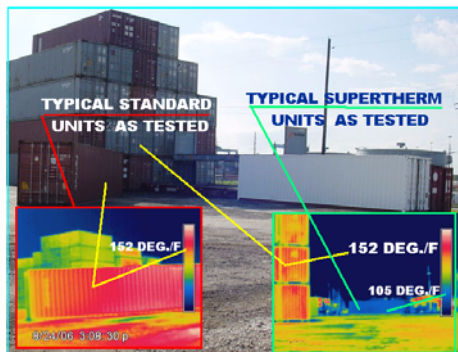
All load conducting surfaces on both containers were analyzed. 4,320 data points were recorded at 2 minute intervals for a 24 hour period with a synopsis of the findings as follows:





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**SUPER THERM**  
**FIELD TEST RESULTS**  
**RETROFITTED**  
**SHIPPING CONTAINERS**  
**AUGUST 2006**

TYPICAL  
THERMOGRAPHIC  
SURVEY RESULTS



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INTERNATIONAL SOUTHWEST  
**SUPER THERM**  
**FIELD TEST RESULTS**  
**RETROFITTED**  
**SHIPPING CONTAINERS**  
**AUGUST 2006**

TYPICAL DATA COLLECTING  
POINT AND SURFACE MOISTURE  
TEST SUPERTHERM UNIT



TYPICAL DATA COLLECTING  
POINT AND SURFACE MOISTURE  
TEST STANDARD CONTAINER



**THE COMBINED DATA INDICATES THAT THE THERMAL ENERGY NECESSARY TO COOL THE CONTAINER COATED WITH THE SUPER THERM PRODUCT WOULD REQUIRE 46 to 52% LESS ENERGY** at the time of this survey.

**PRECISION & BIAS**

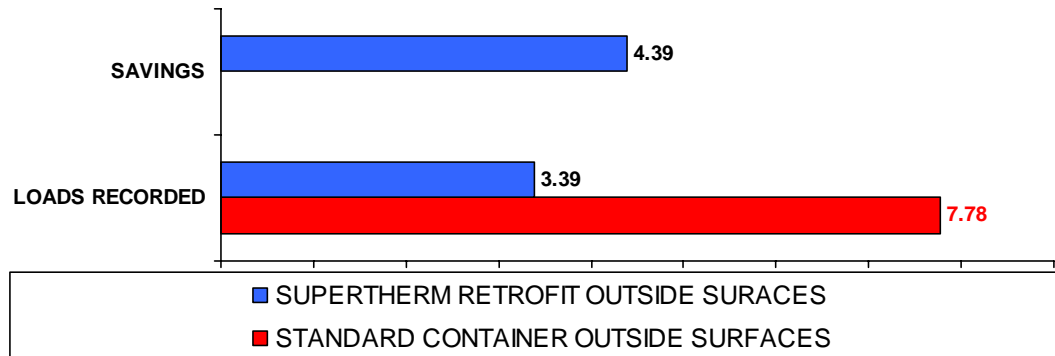
In an effort to insure repeatable results additional test were conducted as follows;



Infiltration factors around all door seals were equal ( 0 CFM & 0 PA ) and had no adverse effect on the recorded data.

The **EXTERNAL SURFACE Energy Flow Analysis** also parallel the Internal Surface data as seen in the chart below;

**TONS ( 12,000 BTU ) OF COOLING LOAD\***  
**BEING LOST THROUGH EXTERNAL SURFACES**  
**FROM INSIDE THE CONTAINER**



\* Cooling source 43 Degree/F water at a 6.5 GPM flow rate supplied by a calibration flow tube.

### Field Test Results

The location of the test specimens was adequate. Both containers were of standard construction consisting of Carbon Steel side wall, roof and deck sheeting's with a standard wood flooring overlay. The calculated R-Value of the existing Steel parent materials was found to be approximately an R-1.70. The only difference between the two containers consisting of approximately 2,690 Cubic Feet of **Control Zone Area** was the external **SUPER THERM COATING**.




As noted in the test results on the prior pages of this report the differences created by the **SUPER THERM PRODUCT concerning load reductions produced by thermal conduction, convection and absorption WERE SIGNIFICANT.**



Additionally, *significant reductions in internal moisture levels 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, Heat Flux and Thermographic analysis indicated that the *standard container* would require **a minimum of 46% more BTU's of cooling energy** to maintain a comfort level **below 70 Degrees/ F** with the conditions present at the time of this survey.

In retrospect, the container coated with the *SUPER THERM PRODUCT* reduce these loads to manageable levels to maintain the same comfort level. The *Ultraviolet absorption test* also showed a possible reduction in *SURFACE MAINTENANCE* as the majority of the *Harmful UV* that normally reduces coatings service life *is not being absorbed by the SUPER THERM COATING* itself. The aforementioned internal Humidity reduction factors took place *regardless of the amount of direct solar gain*.

### CLOSING COMMENTS

Let me *thank*  *Intermodal Facility & Maintenance, Inc.* for giving us the opportunity to use their facility as a field test site. The data collected is a valuable asset to our *ECAP* program in building a comprehensive profiling of *actual energy related loads* that occur in *real life applications*. 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 report is meant to be an educational guide to familiarize you *with the actual performance curves of your chosen Energy Conservation Measures* based on your supplied data and our field test results.



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This is the third time we have had the pleasure to test *SUPER THERM PRODUCTS*, it is rare that a single product will show such *Repeatable Results* in three totally different environments, South Florida, Denver Colorado and LaPorte Texas 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 goals.



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