SUPERIOR PRODUCTS
INTERNATIONAL II, INC.

Super Therm® Specifications

Total Solar Reflectance (TSR)	96.1%
Solar Reflectance Index (SRI)	105
Heat Block Factor	0.98
Litres to Weight ratio	1.53 – very high
Emissivity	.91
Solar Absorption	.039
Colour	Egg Shell White
Tintable	Yes
Texture	Silky Matt
Water Based	Yes
Maximum Surface Temp. Application	65°C
Minimum Surface Temp. Application	5°C
Spread Rate per litre	2.4m2 @ 450µ wet
Thickness in Microns (µ) Wet	450µ
Thickness in Microns (µ) Dry	238µ
Coat System	1 Coat
Primer Required	No
Application	Airless, Brush, Roller
Expected Lifespan	30+ Years
Shelf life	3 Years
Maintenance Program Required	No
Fire Rating	Class “A” by NASA
Acoustics Rated	Yes – 50-68%
Condensation Control	Yes
Safety Data Sheets	Yes

Formulation	4 Micron sized ceramics
Binding	Urethanes & Acrylic
% by Solids	70%
% by Volume	54%
Low VOC grams per litre	67
Perm Rating	8.8
ISO Current	Yes
Year Developed	1989
Used Australia since	1995
Manufactured	Kansas, USA
NASA Development	Yes
EPA Approved	Yes
FM Approved	Yes
UL Approved	Yes
Department of Energy Tested	Yes

SUPER THERM Heat (Thermal Energy) Blocking Specifications

SEE the best technology below for blocking radiation heat waves at only 10-14 dry mils in testing:

Features: Thermal Blocking Ceramic Coating

NUMBER ONE FEATURE: "HEAT BLOCKING"

BLOCKS 99% OF THE INITIAL HEAT LOAD ONTO A SURFACE and therefore, reduces the "Heat Available for transfer to the cool side" by the same percentage.

TESTING FOR THIS STATEMENT:
ASTM E1269 "Standard Test Method for Determining Specific Heat Capacity by Differential Scanning Calorimetry".

ASTM E 1461-92 "Standard Test Method for Thermal Diffusivity of Solids by the Flash Method".
Test levels: Below results taken directly from test report
Bare steel plate without SUPER THERM

Temp @ C	BTU Loading and Conducting through
23 (73F)	350.54
50 (122F)	366.39
75 (167F)	366.30
100 (212F)	367.20
Steel Plate coated with 14 mils dry	
23 (73F)	3.77
50 (122F)	3.92
75 (167F)	4.07
100 (212F)	3.99

Average Bare Metal: 362.60 BTU load and passing
Average SUPER THERM plate: 3.94 BTU load and passing
99% Blocking of heat load and conduction to cool side.
Remember: If Heat is reduced to a 1% load onto a surface, there is only 1% of the heat available for transfer.

NOTE: All statements taken directly from report:
The calculations from the ASTM E1461-92 Thermal Diffusivity of Solids by the Flash Method and ASTM E 1269 Specific Heat Capacity by Differential Scanning Calorimetry to measure the thermal diffusivity (a) and the specific heat Cp of Super Therm paint. The thermal conductivity was calculated as a product of these quantities times the bulk density (d), i.e. Conductivity = aCpd.

PAGE 4 of report: **"It should be noted that the conductivity of the paint is independent of the surface to which it is applied – that is, the conductivity of the paint the same on is a metal or a concrete surface."**

Below chart is without SUPER THERM applied to metal plate:

TABLE 4

Thermal Conductivity Calculations

Sample (No.)	Temp. (C)	Density ($gm\ cm^{-3}$)	Specific Heat ($W\text{-}s\text{-}gm^{-1}K^{-1}$)	Diffusivity ($cm^2\ sec^{-1}$)	Conduct. ($W\text{-}cm^{-1}\ K^{-1}$)	Conduct. (BTU *)	Temp (F)
Plate	23.0	7.746	0.4407	0.14800	0.50523	350.54	73.4
	50.0	7.746	0.4638	0.14700	0.52808	366.39	122.0
	75.0	7.746	0.4800	0.14200	0.52796	366.30	167.0
	100.0	7.746	0.4951	0.13800	0.52925	367.20	212.0

* (BTU in $hr^{-1}\ ft^{-2}\ F^{-1}$)

Below chart is with SUPER THERM applied to metal plate: showing the blocking of BTU heat flow being reduced from 365.20 BTU conduction to only 3.99 BTU conduction:

TABLE 5

Thermal Conductivity Calculations

Sample (No.)	Temp. (C)	Density ($gm\ cm^{-3}$)	Specific Heat ($W\text{-}s\text{-}gm^{-1}K^{-1}$)	Diffusivity ($cm^2\ sec^{-1}$)	Conduct. ($W\text{-}cm^{-1}\ K^{-1}$)	Conduct. (BTU *)	Temp (F)
t=0.0149	23.0	1.639	1.1871	0.00279	0.00543	3.77	73.4
	50.0	1.639	1.2657	0.00272	0.00564	3.92	122.0
	75.0	1.639	1.3211	0.00271	0.00587	4.07	167.0
	100.0	1.639	1.3695	0.00256	0.00575	3.99	212.0
t=0.0397	23.0	1.639	1.1871	0.00324	0.00630	4.37	73.4
	50.0	1.639	1.2657	0.00303	0.00629	4.36	122.0
	75.0	1.639	1.3211	0.00287	0.00621	4.31	167.0
	100.0	1.639	1.3695	0.00274	0.00615	4.27	212.0
t=0.0474	23.0	1.639	1.1871	0.00324	0.00630	4.37	73.4
	50.0	1.639	1.2657	0.00311	0.00645	4.48	122.0
	75.0	1.639	1.3211	0.00300	0.00650	4.51	167.0
	100.0	1.639	1.3695	0.00285	0.00640	4.44	212.0

* (BTU in $hr^{-1}\ ft^{-2}\ F^{-1}$)

Important to note that Specific Heat, Density and Thermal Diffusivity are used to Calculate Thermal Conductance and for Heat Resistance.

Note: According to humidity level, wind and climate, this BTU conduction will change.

SUPER THERM covers 100% of the wall or surface, AND.
"NOT JUST BETWEEN THE STUDS".

Standard insulation materials – absorb 100% of the heat and slows the speed by means of conductivity and thickness. The more the thickness, the longer it takes to transfer to the cool side. Due to moisture load (see ASHRAE reports), wind and compaction into walls, this does not work very well. Remember also, all the standard insulation is "between" studs in the walls and rafters which can be 12.5% of the entire wall space—not insulated.

ADDITIONAL FEATURES of how SUPER THERM blocks heat:

- Reflects 95% of the sum total of all three heat waves
  from an **average** of Japan Testing Standard Laboratory/ Russian Academy of Science testing and US ASTM testing results:
  UV – 99%
  Short Wave (Visual) – 92%(Japan-JIS A5759 5.3.4 (b) specific waves. CRRC (Cool Roof Rating Council) testing: 83.5% (ASTM C1549) combination of a limited number of waves in the ASTM test procedure.
  - Long Wave (Infrared) – 99.5% (Japan - JIS A5759 5.3.4 (c) specific waves. CRRC testing: Not specific on testing IR range of waves with ASTM.

ASTM C236 (Revised to C1363-93) VTEC Lab and National Certified Testing Laboratories, Tested 2002 ("Standard Test Method for Steady-State Thermal performance of Building Assemblies by Means of a Guarded Hot Box". Fiberglass at 3" rated 0.53 BTU K value. One coat of SUPER THERM at 10 dry mils rated 0.31 BTU K value and one coat applied at 10 dry mils to one side of wall and another coat applied to opposite side at 10 dry mils rated BTU K value of 0.21.

Emissivity rating of 0.91 **– R&D Services (Dr. David Yarbrough)** May 2, 2006. Throws off any heat absorbed from its' surface at a 91% rate. Heat that comes in contact with surface of SUPER THERM is repelled at a 91% rate back to the atmosphere or room. This allows only 0.09% of heat to emit to the cool side.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

R&D Services

Test Report

CRRC - Initial Data for Super-Therm Roof System

Prepared For:

Mr. Craig Smith
Superior Products International II, Inc.
10835 W. 78th Street
Shawnee, KS 66214

R & D Services, Inc.
P.O. Box 2400
Cookeville, Tennessee 38502-2400

Report: RD06249

Reviewed by: David W. Yarbrough
David W. Yarbrough, PhD, PE
President

May 2, 2006

CRRC
COOL ROOF RATING COUNCIL

Test Results Report

1738 Excelsior Avenue • Oakland, CA 94602 • Toll-free (866) 465-2523 • Fax (510) 482-4421 • www.coolroofs.org

Section C; 17-24: Accredited Independent Testing Laboratory Test Results and Signature (this section to be filled out by AITL only) SYSTEM

17. **Laboratory ID** (Initial Ratings) RDS

18. **Laboratory ID** (Aged Ratings)

19. **Lab Report ID** (Initial Ratings) RD06249

20. **Lab report ID** (Aged Ratings)

21. **Tested Initial Radiative Properties: (Air mass of 1.5 used in reflectance measurements** ☑ (check for verification)

21a. *Group A*—MFR. Batch # 012306

Panel ID	Solar Reflectance	Thermal Emittance
1. 11	0.831	~~0.89~~ 0.90
2. 12	0.833	~~0.89~~ 0.91
3. 10	0.832	~~0.89~~ 0.90
Batch Average	0.832	~~0.89~~ 0.90

21b. *Group B*—MFR. Batch # 021406

Panel ID	Solar Reflectance	Thermal Emittance
1. 16	0.836	~~0.89~~ 0.91
2. 17	0.834	~~0.89~~ 0.91
3. 13	0.836	~~0.89~~ 0.91
Batch Average	0.835	0.91

21c. **Results if preparing samples according to CRRC-1 Section 3.5 E (using CRRC-1 Method #1):**
Sample 1 (Batch A): 0.832 / 0.90 (SR / TE) Sample 2 (Batch B): 0.835 / 0.91 (SR / TE) Sample 3 (Batch A&B): ____ / ____ (SR / TE)

21d. **Average for all initial tests (2 decimal places):** Solar Reflectance (SR) 0.833 Thermal Emittance (TE) 0.91

21e. **Presumed Non-Variegated Particle or Gravel Coated Roofing Product 5-Point Reflectance Test Results:** (See CRRC-1 section 3.5.1 E for instructions) ____ ____ ____ ____ ____ **Average Reflectance** ____

21f. **Air mass of 1.5 used in reflectance measurements** ☐ **(check box to confirm)**

22. **Tested Aged Radiative Properties:**

22a. *Hot/Humid Climate Exposure* Panel ID	Solar Reflectance	Thermal Emittance
1.		
2.		
3.		

22b. *Cold/Temperate Exposure* Panel ID	Solar Reflectance	Thermal Emittance
1.		
2.		
3.		

22c. *Hot/Dry Climate Exposure* Panel ID	Solar Reflectance	Thermal Emittance
1.		
2.		
3.		

22d. **Results if preparing samples according to CRRC-1 Section 3.5 E (using CRRC-1 Method #1):**
Sample 1 (Batch A): ____ / ____ (SR / TE) Sample 2 (Batch B): ____ / ____ (SR / TE) Sample 3 (Batch A&B): ____ / ____ (SR / TE)

22e. **Average for all initial tests (2 decimal places):** Solar Reflectance (SR) ____ Thermal Emittance (TE) ____

22f. **Air mass of 1.5 used in reflectance measurements** ☐ **(check box to confirm)**

23. **Tests conducted:**

Type	Initial Test	Aged Test
☐ E903 Test	Date ____	Date ____
☐ E1918 Test	Date ____	Date ____
☑ C1549 Test	Date 4/26/06	Date ____
☑ C1371 Test	Date 4/26/06	Date ____
☐ CRRC-1 Method #1	Date ____	Date ____

24. **The undersigned certifies that, to the best of his/her knowledge, the measurements contained herein are true and accurate:**

DAVID W. YARBROUGH
Responsible Person's Printed Name

Daniel W. Yarbrough
Responsible Person's Signature (Initial Tests) 4/26/06 Date

Responsible Person's Signature (Aged Tests) Date

Emissivity rating of 99.5 on long wave emissivity (IR) and 92.2 Reflectivity on solar reflectivity – **Japan Testing Center** for Construction Materials November 8th, 1994.

Test request no. 57463
Application date: July 13th,

R ***Cosmo Trade and Service Co., Ltd.***

Head of the new materials
business room ***Mr. Kazuo***
KOMATSU 6 Kojimachi 6-chome

Title of test: Simulation and calculation of temperature and heat penetration due to solar reflectivity and long wavelength emissivity of the reflective thermal coating "SUPERTHERM[1]"

The recorded test results are as presented in this

document.

November 8th, 1994

[Logo] Test Report

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

1. Contents of the request

The following measurements and calculations were carried out with respect to the reflective thermal insulation coating "SUPERTHERM" from the Cosmo Trade and Service Co., Ltd.

(1) Measurement of solar reflectivity and long wavelength emissivity

(2) Calculation of heat penetration at the roof surface and roof surface temperature based on measurement results of (1) for the Tokyo region during summer (July - August) as well as the Okinawa region both during summer (July - August) and winter (January - February)

2. Measurement of solar reflectivity and long wavelength emissivity

2.1 Sample

The sample was a reflective coating which was applied as a coating to the roof surface, the exterior walls, etc. This sample was applied to an iron sheet (about 0.5 mm thick) to provide the test body.

The product name, dimensions, and quantities of the test body are indicated in Table 1.

2.2 Measurement methods

(1) Solar reflectivity

Testing was carried out according JIS A 5759 (film used on window glass) 5.3.4 (b).

(2) Long wavelength emissivity

Testing was carried out according to JIS A 5759 5.3.4 (c).

2.3 Measurement results

The measurement results for solar reflectivity and long wavelength emissivity are shown in Table 2.

Table 1. Test body

Product name	Measured item	Dimensions	Quantity
SUPERTHERM	solar reflectivity	50 x 50 mm	3
	long wavelength emissivity		1

Table 2. Measurement results

Test item \ Test body no.	1	2	3	Average
solar reflectivity	92.1	92.4	92.0	92.2
long wavelength emissivity	99.5			

(Note) For normally utilized white paint, solar reflectivity of about 80%, and long wavelength emissivity is about 90% (source: Architecture (handbook), compiled by the Architectural Institute of Japan, 1980).

The Russian Academy of Sciences Institution, Institute for Solid State Physics – July 2012 : Result:

Reflection Coefficient%

Polished Aluminum Mirror – 90.4%

Fresh electro-zinc coating – 65.3%
SUPER THERM sample 1 – 96.1%
SUPER THERM sample 2 – 95.9%
SUPER THERM sample 3 – 94.3%
SUPER THERM sample 4 – 94.5%
Conclusion: “Total coefficients of diffuse light reflection for SUPER THERM coat samples in visible band are consistent with (and even several percentages higher) aluminum mirror reflection coefficient, and are substantially higher than reflection coefficients of galvanized iron and duralumin”.

It is understood that blocking the “heat load” over a facility is more effective than allowing 100% of the heat load to occur and then using a standard type insulation to absorb and offer a slow conducting into the facility. Also, once the standard material is loaded with hot moist air and the sun goes down, this will accelerate is fully loaded with heat and will take hours to finish unloading the heat into the cool side before the A/C can cycle.

Russian Academy of Sciences

The Russian Academy of Sciences institution, Institute for Solid State Physics RAS

“Approved by”

Director of ISSP RAS corresponding member of RAS

_____V.V. Kveder

“___” _July_____ 2012

Scientific technical report

on the Agreement 991-12 about research scientific work

"Research of the coat samples reflection in visible and infra-red bands".

Results of reflection coefficients measurement

In the course of the measurements it was defined that obtained reflection coefficients values do not depend on the size of samples used for measurements, and spread in values of the same type samples stays within the limit of a photometer accuracy.

The Table gives summary data of total reflection coefficients measurement with the use of a resolving light filter, i.e. in visible band.

Table. Absolute values of reflection coefficients of SuperTerm coat samples and comparison samples.

Reflection coefficient ρ (%)							
Mirror (*Al*)	*D16*	Fresh electro-zinc coating	Oxygenated electro-zinc coating	"*ST*" Sample 1	"*ST*" Sample 2	"*ST*" Sample 3	"*ST*" Sample 4
90.4	45.7	65.3	16.3	96.1	95.9	94.3	94.5

As you can see in the table, coat samples have much higher reflection coefficient in comparison with bottom layer made of galvanized iron (both fresh and oxygenated) and duralumin samples. And what is more, the coats reflection coefficient in visible band appeared to be a little higher than the aluminum mirror reflection coefficient too.

Point: If you never "load heat", the facility never absorbs and holds heat, therefore, keeping the facility cool and when the sun goes down, it is immediately cool causing the A/C to cycle or shut down.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

FLORIDA ENERGY OFFICE "ECAP" (Energy Conservation Assistance Program).

Prepared by Alexander Othmer CEA/CBA/NDE III, Director Florida Energy Office/ ECAP Program, University of South Florida/Small business Development Center.

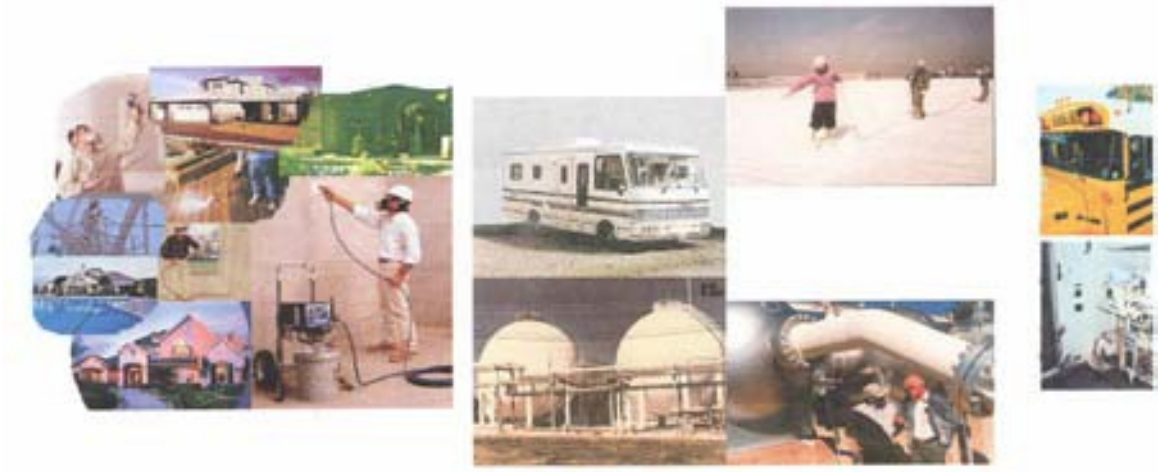
Three separate tests performed in three different parts of the US and different environments to show insulation/heat blocking results.

TEST 1: February 10th and 11th, 2003, Dade County, Florida. Test method of comparing Utility loads in Standard constructed building. Objective: reduced utility loads in occupied residential, commercial and government buildings. "Comparison to energy related products to displaced conventional utility loads". Only ½ of the roof was covered with SUPER THERM. Roof solar Gain Loads reduced by 20%-30%. This qualifies as an effective Energy Conservation Measure (ECM). Over 5,780 data points were taken over a 24 hr period. Load reduction was 22%, rejecting 121 BTU/Sqft/hr. Air conditioning load savings from the SUPER THERM retrofit was approximately 11.09 tons of load per 24 hour period. Solar

gain: Standard roof 206 BTU load per sq ft. solar gain/ 145 thermal load and 98.0 UV absorption compared to SUPER THERM coated roof having 85 BTU load per sq.ft solar gain/ 118 thermal load and 03.0 UV absorption. **Reduced Environmental Impact:** Reduced 66 pounds of power plant emissions/ hour. ROI (Payback) is 2.2 years.

FIELD TEST RESULTS

SUPERTHERM



On February 10th & 11 th, 2003 a survey was conducted on the above product, applied to a residential home roofing system located in Dade County, Florida in accordance with the **S**tate of **F**lorida **E**nergy **O**ffice / **ENERGY CONSERVATION ASSISTANCE PROGRAMS Designation: ECAP-CUL-1-99**

Test Method for Comparing Utility Loads in Standard Constructed Buildings.

The objective of this procedure is to determine the ***actual impact on a facility, after the implementation of a Energy Conservation Retrofit*** and verify the reduced utility loads, if any, 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 ***energy related products*** to ***displaced conventional utility loads***. This procedure addresses the energy consumption properties of the equipment and structural envelope tested and has no relationship to structural, electrical or fire code requirements.

- Our survey indicated that your application of ***Ceramic Coating*** reduced total Roof Solar Gain Loads by **20 to 30%.** This would qualify as an effective ***E***nergy ***C***onservation ***M***easure (***ECM***) fundable with Federal and State of Florida Energy Grant Dollars where applicable.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

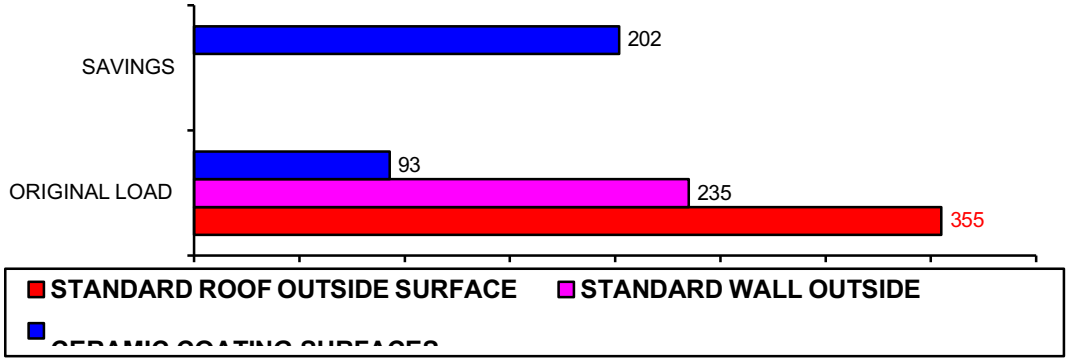
"**TEST 2:** July 19th and 20th 2004, Denver, Colorado. Energy loads reduced approximately 26% - 30% (ECM). Average savings of BTU load is 202 BTU's per sq.ft. per hour. "The thermal energy necessary to heat or cool the building coated with the ceramic coating product required 26% less energy". 7,250 data points were recorded at 2 min. intervals for a 24 hr period. Standard building requires 1,037 BTU's of heating or cooling energy per sq. ft to maintain a minimal comfort level. SUPER TEHRM coated building requires 766 BTU's per sq.ft. Reduction of 271 BTU's per hour.

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 State of Florida Energy Office / 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 Ceramic Coating, 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



"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

TEST 3: Shipping container August 23rd and 24th 2006, Intermodal Facility and Maintenance, Inc. La Porte, Texas. Conduction related energy loads were reduced and energy needed to cool the container would require approximately 46% to 52% less energy by applying SUPER THERM. NOTE: "This is the third time we have had the pleasure to test SUPER TEHRM products, it is rare that a single product will show such Repeatable Results in three totally different environments, South Florida, Denver Colorado and La Port, Texas – a true testimonial to your products ENERGY STAR rating."

On August 23rd & 24th 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** *CERAMIC COATING,* **as applied to the structures 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 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 ***CERAMIC COATING*** as an ***E***nergy ***C***onservation ***M***easure (***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

Florida ECAP

Florida Energy Conservation Assistance Program

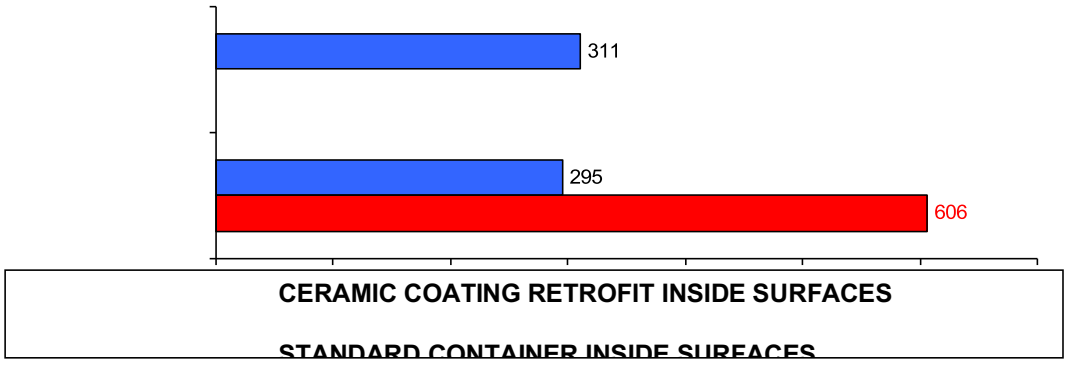
ENERGY MEASUREMENT Services

Tampa Office (813) 545-5806

www.FLORIDAECAP.ORG

SUPERIOR PRODUCTS INTERNATIONAL SOUTHWEST

SUPER THERM FIELD TEST RESULTS RETROFITTED SHIPPING CONTAINERS AUGUST 2006



"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

GOOD-STANDING FACTORIES IN ENERGY CONTROL IMPROVEMENT CASE EXAMPLES- JAPAN April 1999,

NATIONAL ELECTRICITY SAVING COMMITTEE.

40,300 sq.m (443,300 sq ft.) Rock Wool under the roof as standard when constructed and at this point of time for the test, the SUPER THERM was applied over the top of the roof facing the sun. Result reported: Energy Savings in yen and dollars was 11,050,560 yen/year ($102,320 dollars). ROI payback is 13 months over a 443,300 sq.ft roof.

National Electricity Saving Committee, Japan, April 1999 Tokyo. Information taken directly from report:

"Application of Insulation Coating on Factory Roofs"
Secretary of State for Trade and Industry – Director and General of the Agency of Natural Resources and Energy.
49,000 sq.m or 528,000 sq.ft roof surface to be coated with SUPER THERM (referred to as COOL THERM in Japan).
Results: Energy Savings
Condition: Fine day in summer with outside Temp: 32C (90F)
Surface: Ceramic Insulation Coating
(Thickness: 180 micron)
Inside: Rock Wool Sprayed(t=10mm)
1. Energy Saving

Condition: Fine day in summer Outside Temperature: 32C (90F)	Room Surface Temp.	
Outside Surface Temp		
Before	63C (145F)	61C (141F)
After	41C (105F)	38C (100F)
Difference	▲2_2_C_ _(_7_1_F_)_ _	▲2_3_C_ _(_7_3_F_)_ _

Energy Saving Effect:
40,300sqm × 23C (73F) × 2.76Kcal/h·sqm·C
(K Value: over-all coefficient of heat transfer for steel)
= 2,558,244kcal/h
2,558,244kcal/h × 8h/day × 20 days/month × 6 months/year × 0.75
(Period of Air-conditioning Used) (Fine Sky Ratio)
= 1,841,760 Mcal/year
Calculation of Electricity:
1,841,760 × 10³kcal/year ÷ _3,000kcal/h·RT × 1.2kW/RT
= 736,704kWh/year
Energy Saving Cost:

736,704kWh/year × ¥15/kWh = ¥11,050,560/year
2. Prolongation of Life Span

The re-painting cycle has extended from seven years to nine

○ _I_m_p_r_o_v_e_m_e_n_t _ _E_v_a_l_u_a_t_i_o_n_ _Initial Cost for Improvement (¥10,000) (A)	Energy Saving Effect (¥10,000/year) (B)	Pay-Back Period (year) Excluding Interest (A/B)
Ceramic Insulation Coating 6,850 Bituminous Coating 5,680 Difference 1,170	1,105	1.06

Roof already had Rock Wool installed under the roof structure to insulate the roof.
Room temperature on interior was 61C (141F), after coating with SUPER THERM dropped to 38C (100F) or difference inside the space under the roof of 23C (41F) difference.
Energy Saving Effect: 1,841,760 Mcal/year or 736,704 Wh/year X Yen 15/kWh = Yen 11,050,560/ year or $102,320 USD/ year.
Pay Back Period (year) ROI 1.06 years or 13 months.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

Tucson Airport

According to: Chris Wilt, Airport Facilities Manager, energy savings were achieved even with all the openings and closings of the doors and food facility operations.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

McCarron Airport Las Vegas: Jet Bridges (platforms from building to airplane for loading and unloading of passengers). Coated and stays within 2 degrees of ambient temperature meaning a reduction of exterior surface temperatures of 60 -80 degrees during summer.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

HOOVER DAM BYPASS BRIDGE RAILINGS.

SUPER THERM was chosen from a group of competing coatings to reduce the heat on the hand-rails (140F) down to ambient temperature to prevent visitor burns from leaning onto the railing. Awarded the E. CRONE KNOY AWARD by SSPC for new efficient technology.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

To: Harry Power
United Anco Services
583 Parkson Road
Henderson, NV 89011

From: J.E. Pritchett
President

Date: November 05, 2009

Re: Surface Preparation Guide Lines for Applying SPI's Rust Grip Primer

Superior Products International's (SPI) normal installation procedure for Rust Grip does not include sandblasting to SSPC-SP10. The "shiny" surface will substantially reduce Rust Grip's ability to penetrate the surface and reduce adhesion pull test results. This letter is to provide the surface preparation standards required prior to the application of the SPI product "Rust Grip" to the carbon steel surfaces of the Pedestrian Handrails to be installed on the HDB Bridge Pedestrian Walk Way.

1. Power wash all carbon steel surfaces with a 3500 PSI minimum power washer, using a citrus based cleaner such as "Simple Green" to remove contaminates such as dirt, oil, tar, grease, etc.

2. The surfaces should give the appearance of a clean, but slightly rusty surface "flash rust" with no visible contamination present.

3. Surface must be completely dry prior to application of coatings. If moisture persists wiping down of the surface with Acetone is required.

Rust Grip's desired profile for application is a rusted surface. If you were to blast to a SSPC-SP10, SPI would recommend waiting till the white metal develops a blush before applying (or spraying with water to accelerate this condition). For Rust Grip, a SSPC-SP2 achieved with a 3,500 psi power wash is the recommended preparation for the railing. Blasting to a SSPC-SP10 is neither the normal nor the recommended installation procedure.

Consequently, to achieve the maximum adhesion of the Rust Grip product used as a primer coat for Super Therm and Enamo Grip, SPI's normal and recommended installation procedure would be outlined above. SPI has decreased the size of the ceramic in Super Therm that is visible to the eye for a smoother appearance and Enamo Grip is a self-leveling urethane that provides outstanding resistance to water, humidity ,stains, chemicals and solvents, and is tremendously scuff, mar and impact resistant.

John Grey is an Industrial Engineer who has served as a SPI Senior Technical Advisor and Project Manager for the past six years on some of SPI largest projects. He has the technical background, product knowledge and project experience to bring this prestigious project to a successful completion.

SUPERIOR PRODUCTS
INTERNATIONAL II, INC.

HOOVER DAM BYPASS BRIDGE HAND RAILINGS
UPDATE AFTER 2 YEARS IN SERVICE
CURRENT PICTURES OF THE RAILING CONDITION

COATED FALL OF 2010 and UPDATED September 2012

THREE (3) TO FIVE (5) MILLION PEOPLE PER YEAR WALK OVER AND HANDLE THE RAILING. LEAN ON, SLIDE OVER, SWEAT, SPILL DRINKS RUB WITH BELTS, JEANS AND OTHER MATERIALS AND OBJECTS

THE SUPER THERM® SYSTEM ((SUPER THERM® WITH OVER COAT OF ENAMO GRIP IN LIGHT GREY COLOR)) WAS TESTED AGAINST THE COMPETITIVE COATINGS TO SEE WHICH COATING COULD REDUCE THE SURFACE TEMPERATURE OF THE RAILING IN THE SUMMER HEAT OF 121F (49C) THAT CAUSED THE RAILING SURFACE TO BE 146F (63C) AND BURN HANDS.

THE COMPETITIVE COATING TESTED REDUCED THE TEMPERATURE ON THE RAILING FROM 146F (63C) DOWN TO 144F (62C).
ONLY 2F (1C) DROP IN SURFACE TEMPERATURE
THE SUPER THERM® SYSTEM REDUCED THE SURFACE TEMPERATURE ON THE RAILING FROM 146F (63C) DOWN TO 127F (52.8C)
19F(9.2C) DROP IN SURFACE TEMPERATURE OR ONLY 6F (3C) OVER AMBIENT
TESTED BY CONSTRUCTION ENGINEERS ON-SITE 7/27/09

PROJECT PERFORMED BY JOHN GREY/ SANDRA HUBBERT – DISTRIBUTORS

AS THE CURRENT PICTURES SHOW, AFTER THREE YEARS OF 3-5 MILLION PEOPLE HANDLING THE RAILINGS, THE SYSTEM LOOKS AS GOOD NOW AS IT DID WHEN FIRST COATED AND KEEPING THE HANDRAILING COOLER AS SCHEDULED.

10835 W. 78th Street • Shawnee, Kansas 66214 • Phone: 913-962-4848; Fax: 913-962-6767
Website: www.spicoatings.com Email: sales@spicoatings.com

Crone Knoy Award

E. Crone Knoy Award

for a single, recent, outstanding achievement in industrial or commercial coatings work that demonstrates innovation

Hoover Dam Bypass Bridge - Colorado River Bridge

Spans between Nevada and Arizona

Structure Owner: Federal Highway Administration
Contractor/Applicator: United/Anco Services - A Member of The Brock Group
Coating Material Suppliers: PPG Marine and Protective Coatings, and Superior Products International (SPI)

January 31, 2011
Las Vegas, NV

President

Executive Director

Hoover Dam Bypass – Colorado River Bridge

Named for E. Crone Knoy, the late founder and president of Tank Industry Consultants, this award stands for coatings work that demonstrates innovation, durability, or utility. Qualities representing outstanding achievement may include excellence in craftsman-ship or execution of work or the use of state-of-the-art techniques and products to creatively solve a problem or provide long-term service. This year's winner is the Hoover Dam Bypass-Colorado River Bridge.

For decades, the top of the Hoover Dam carried U.S. Highway 93—a two-lane stretch of road whose increased traffic, sharp curves, and post-911 vehicle inspections had created a safety and congestion problem in need of a solution.

The solution was the Hoover Dam Bypass Project, which eliminated having to drive over top of the dam. To move U.S. 93 traffic off the dam, the Colorado River Bridge was built approximately 1,500 feet south of the Hoover Dam, spanning the Black Canyon and sitting 900 feet high above the river. At 1,900 feet long and with an arch span of 1,060 feet, the U.S. Bureau of Reclamation says, it is the longest concrete arch in the Western Hemisphere, in addition to being the first concrete-steel composite arch bridge built in the U.S.

The scope of the project included coating the interior and exterior of the steel girders, spans, catwalks, tubs, bearing pads, and 67 handrail sections that were each 30 feet long. Spans were coated with a primer coat and two coats of urethane. Handrails were power-washed and spray-coated with a rust grip primer coat. They were then coated with a unique coating system that utilizes a heat dissipating material. This can lower the surface temperature of the handrails by 10% and reflect 95% of radiation from the sun, both important factors in the life of a substrate sitting in extreme desert temperatures and high UV sun exposure. Handrails also received clear and tinted enamo grip coatings.

Work was completed 900 feet over the Colorado River, with winds reaching 15 to 20 knots and temperatures rising over 100 F. There were no OSHA Recordable Incidents during the two-year painting work.

The Colorado River Bridge has been named the "Mike O'Callaghan-Pat Tillman Memorial Bridge." O'Callaghan was formerly a Nevada governor and passed away in 2004. Tillman played for the Arizona Cardinals until leaving the NFL to join the Army. He was killed in Afghanistan in 2004.

Location: Spans the Colorado River between Nevada and Arizona

Structure Owner: Federal Highway Administration

Contractor/Applicator: United/Anco Services, Inc.

Coating Material Supplier: Superior Products International (SPI) and PPG Protective and Marine Coatings

Start Date: August 2008

Completion Date: October 2010

(l-r) Rodney McKnight, Operations Support, United/Anco Services; Shawn Nelson, Regional Manager West, PMC Marine Group, PPG; John Woods, Account Executive, Pacific Southwest Coatings, PPG Distributor; Bonnie Klamerus, FHWA Structures Manager; Bruce Batinich, Dir. of Business Development, West Region, The Brock Group, United/Anco Services; and Craig Smith, Technical Director, Superior Products International. Photo courtesy of SSPC.

Hi Superior Products International II, Inc.

Thank you for speaking with me today. I am sorry that I am notifying you at this late date, but we were waiting on confirmation that we would have an owner's representative attending the conference to accept the award.

In 2006, SSPC developed a series or awards to recognize the work of teams of contractors, designers, end users and coating manufacturers for excellence on particular coatings projects. The Hoover Dam Bypass-Colorado River Bridge was selected to receive our Crone Knoy Award. The Crone Knoy Award is for outstanding achievement in commercial or industrial coatings work that demonstrates innovation, durability or utility. The project was submitted by United Anco Services of the Brock Group.

The awards will be handed out at the SSPC conference in Las Vegas at the Mandalay Bay Hotel at our Annual Meeting and Awards Luncheon on Monday, January 31 at 11:00 am in Islander F/G. Each participant in the project (owner, applicator and coating material supplier) will receive a plaque. All of the structures in the awards program will be featured in a photo essay in the JPCL after the SSPC conference.

We hope that you will be able to attend. Please let me know if you have any questions and if you will be able to attend.

Best regards, Terry--

Ms. Terry Sowers

Director of Member

Services

SSPC: The Society for

Protective Coatings

40 24th St.

Pittsburgh, PA 15222-4656

Direct Line 412-288-6038

Ph: (412) 281-2331, Ext 2219

Fax: (412) 281-9995

SSPC: The Society for Protective Coatings. Visit www.sspc.org for more information on SSPC. Mark your calendar now for SSPC's Greencoat in Las Vegas, January 31-Feb 3, 2011!

SUPERIOR PRODUCTS INTERNATIONAL
HOOVER DAM BYPASS BRIDGE PROJECT

Project:	Hoover Dam Bypass Bridge	Completed:	October 2010
Manufacturer Rep:	John Grey, Superior Products	Contact #:	(843) 813-6402
Product Recommendations:	Primer: Rust Grip® applied at 8 mils wet/4 mils dry Insulation: Super Therm® applied at 16 mils wet/10 mils dry Topcoat: Enamo Grip applied at 8 mils wet/4 mils dry		

The Hoover Dam Bypass Bridge is set to open in mid-October 2010 after nearly eight years and $240 million worth of work. The 1,900-foot engineering wonder perched 890 feet above the Colorado River is expected to drastically cut travel time along the main route between Las Vegas and Phoenix. The observation deck expects 3-5 million visitors each year. After testing against another manufacture to compare the ability of Super Therm to prevent radiant heat from loading, Super Therm was a clear winner.



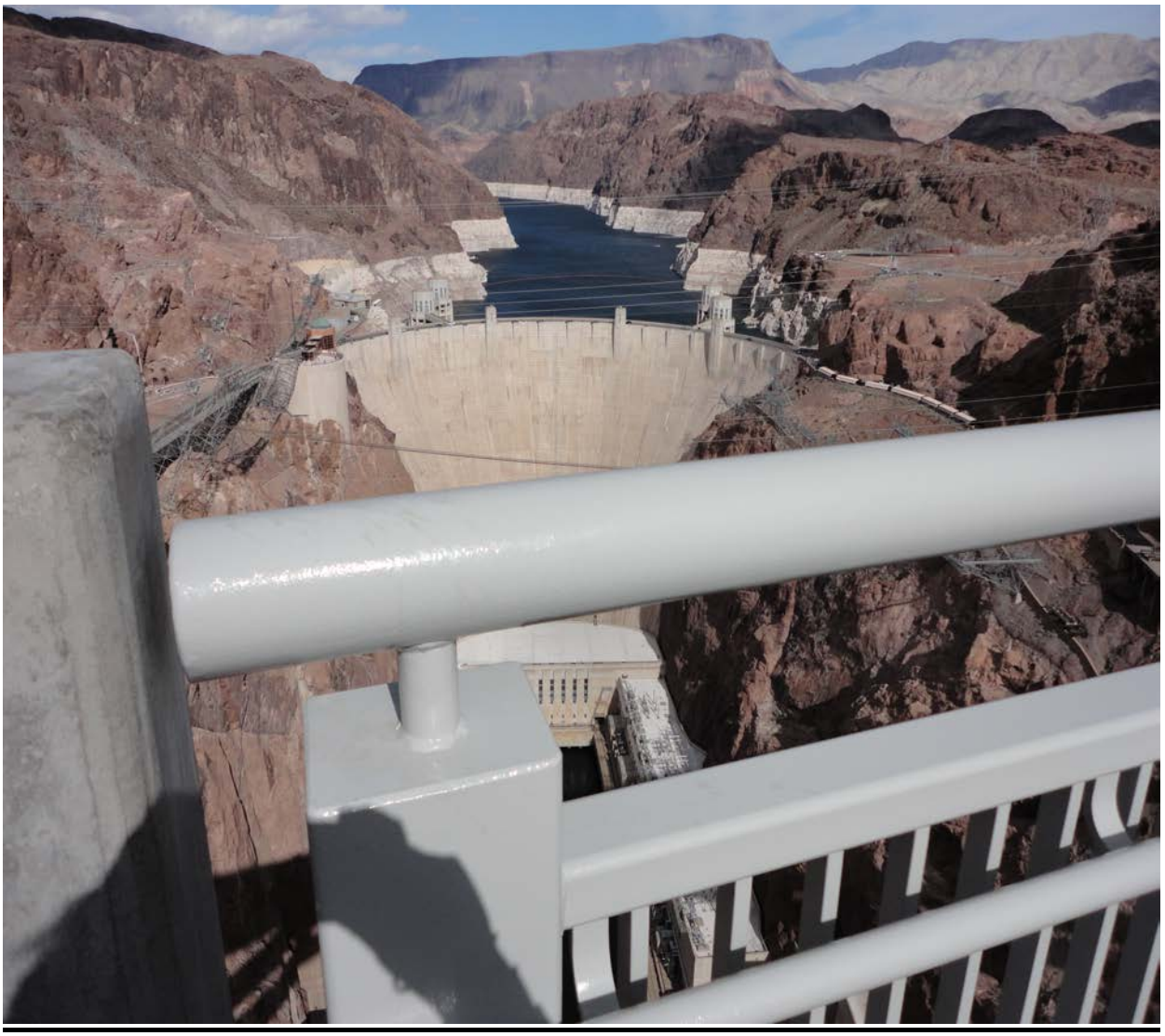
Steel railings were allowed to develop flash rust in preparation for the Rust Grip® application.



Railings were power washed at 3,500 psi and primed with Rust Grip®.


Super Therm® was applied to prevent heat from loading onto the steel railings, possibly burning visitors.


Enamo Grip topccoated Super Therm® to prevent hand oils from deteriorating surface.




Nevada

12 YEAR UPDATE

ORIGINAL APPLICATION 2010 AND
THIS UPDATE IS FROM 2022

Outstanding show for RG/ST/EG system. 12 years and looks like new
Yes sir, it looks like it was just painted. And grabbing ahold of the rails they had zero heat.
The paint job looks perfect!

RUSTGRIP
SUPERTHERM
ENAMOGRIP

Cheers,
RL

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

US Air Force: The first metal double wide building to be coated with SUPER THERM at 10 dry mils (250 microns) on Davis-Monthan Airbase in Tucson, Arizona. A metal building without fiberglass and a drop ceiling. The day before the conference and review of the building by 400 attendees was 111F (44C) and the day of the conference when J.E. Pritchett spoke at the conference and when all attendees touched the building and went inside to check the interior the ambient temperatures was 113 F (45C). The Air conditioning units had been turned off three days prior to the conference to show how well SUPER THERM would

block the loading of radiation heat onto the exterior skin of the building (mobile home metal trailer). Doors were locked shut during the three days and no air conditioning was on. When the doors were opened for the attendees to walk into the building and experience the results, the interior temperature was 85F (29C). So, after three days in temperatures of 111F to 113F, SUPER THERM tinted slightly to a tan color to match the desert tan scheme, metal, and facing the sun without ventilation, 85F on the interior is exceptional. When uncoated metal was tested next to the trailer, the metal was read at 198F and 205F surface temperature.

Steps with AirForce:

Statement of Work

Supertherm – Superior Products

19 September 2013

The Coatings Technology Integration Office (CTIO) and the University of Dayton Research Institute (UDRI) will perform the following work for Aircraft Maintenance And Regeneration Group (AMARG) and for Superior Products International.

Superior Products will supply all coating materials for testing. UDRI will provide substrates for test coatings. The acrylic material meets the MIL-P-5425, Finish A specification. Prior to application to the acrylic the acrylic will be treated with polish to aid in removal of the test coating per TO 1-1-686 Chapter 11. Aircraft skin control samples will be supplied by AMARG with standard F-16 coating systems and Spraylat control coatings applied for heat reflection test comparison.

Superior Products International will supply a technical representative for the application of the materials. A Binks HVLP spray gun will be used and will be supplied with the proper fluid tips, needles. The materials will be applied to test coupons and also to a canopy supplied by AMARG.

The desired output of the test is to validate improved reduction of heat loading on the surface of the aircraft to better cool aircraft electronic components as compared to the current process using Spraylat coating. The second part of the desired output is to validate that the aircraft preservation coating is peelable (removable) after four years of exposure to desert environment.

The following tests will be performed:

Accelerated aging: Prior to testing the samples will be exposed to a minimum of 1000 hours of Xenon Arc exposure. The exposure cycle will be:

a. Spectral irradiance set to .35 watts/meter^2 controlled at 340nm.
b. Black panel temperature set at 63° C ± 2.5° C
   The exposure cycle is set to 102 minutes of light exposure followed by light and water spray for 18 minutes

Peel test: Using the same or similar Instron equipment used for the previous test. Testing will be performed on both aluminum and acrylic. This test will probably be performed at the campus of the University of Dayton.

Heat Resistance: Heat resistance will be measured on the surface of the test items and on the underside of the test items with thermocouples and infrared heat gun. Testing will be performed on acrylic sample, actual F-16 aircraft canopy, and aluminum aircraft skin samples. The heat source has not yet been identified although an infrared heat source is recommended.

AFRL TEST PLAN:

PEELABLE, HEAT REFLECTIVE COATING FOR AIRCRAFT IN DESERT STORAGE AT AEROSPACE MAINTENANCE AND REGENERATRION GROUP, AMARG, DAVIS-MONTHAN AFB

Contract Number:

CTIO Tracking Number: UDRI-

Prepared by:

Christopher Joseph
University of Dayton Research Institute
300 College Park
Dayton, OH 45469-0054

Prepared for:

Coating Technology Integration Office
AFRL/RXSSO
2700 D Street, Building 1661
Wright-Patterson AFB, OH 45433

19 September 2013

Accepted:		Approved:	
Bill Hoogsteden	Date	Bill Culhane	Date
Project Leader, CTIO		Program Manager, UDRI	

SUPERIOR PRODUCTS
PEELABLE COATING
FOR DAVIS-MONTHAN AFB
Final Report

CRADA Number: 10-028-RX-02
CTIO Tracking Number: UDRI-J8V1F2-01
UDRI Report Number: UDR-TR-2015-209

Prepared by:

Christopher Joseph
University of Dayton Research Institute
300 College Park
Dayton, OH 45469-0054

Prepared for:

Craig Smith
Superior Products International II, Inc.
10835 W. 78th Street
Shawnee, KS 66214

03 November 2015

Approved:

Douglas C. Hansen, Ph.D.
Coatings Group Leader (acting)

Superior Products International and UDRI only.

Air Force

INCH-POUND

MIL-PRF-6799L
03 September 2010
SUPERSEDING
MIL- PRF-6799K
14 September 1998

PERFORMANCE SPECIFICATION

COATINGS, SPRAYABLE, STRIPPABLE, PROTECTIVE, WATER EMULSION

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the performance requirements for water emulsion, protective, strippable, sprayable, coatings for application over metallic, painted, and plastic surfaces.

1.2 Classification. The coatings are furnished as the following type and classes as specified (see 6.2).

1.2.1 Type. The type of coating is as follows:

Type II - Multi-coat system - Exterior (see 3.2.1)

1.2.2 Classes. The classes of coatings are as follows:

Class 1 - Basecoat (black)
Class 1A - Basecoat (black) non-chromate
Class 5 - Topcoat (white or olive drab)
Class 6 - Topcoat (white)
Class 6A- Topcoat (white) non-methanol
Class 7 - Topcoat, brushable (see 3.2.1.2)

Comments, suggestions, or questions on this document should be addressed to: Commander, Naval Air Warfare Center Aircraft Division, Code 4L8000B120-3, Highway 547, Lakehurst, NJ 08733-5100 or emailed to michael.sikora@navy.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.daps.dla.mil.

AMSC N/A FSC 8030

SUPERIOR PRODUCTS
INTERNATIONAL II, INC.

SUPER THERM applied at DM Air Base, Tucson, Arizona

Stephen,

I am happy to assist the Radler foundation, Water Harvest International, and the people of the Sudan with alternative energy technical assistance. I am working with several innovative energy technologies in the Air Force and Dept of Defense. We have been using the Coolerados for about one year now, they are lightweight, compact, silent, and energy efficient. We started with two trailer mounted C-60 units then bought 12 more with some being M-30, M-50, and some C-60 units. They use the same amount of water as a swamp cooler (within 2%) but don't have the moisture, mold, or corrosion problems of a swamp cooler, and they provide 60 degree air here in the hot summer of Arizona. I performed extensive research on this, and the Coolerados are Dept of Energy validated and approved. If you like, I can forward the DoE Reports. The last three pictures are of the portable Coolerado we mounted to a trailer, you can see the diesel heater air temp of 160 degrees, which we placed 6 inches from the inlet of the Coolerado and we measured 60 degrees output from the Coolerado. Being in such a remote location, you would be wise to have spare air and water filters, on hand in the Sudan, to avoid any down time.

The second technology I would recommend for the cement buildings in Sudan, is Super Therm Ceramic Coating. This unique ceramic is Dept of Energy validated and approved, and has four unique ceramic sized and shaped components which make it superior to all other ceramics for this type of application. I have had the Air Force Research Lab perform a one year test on this and it passed their testing. I have coated two buildings here with success that has attracted visitation of many senior military personnel, congressional staff and recently the White House Council for Environmental Quality. The Tucson Int'l Airport also coated the entire airport terminal in 2009, and is saving 20% of their air conditioning electricity costs. The ceramic has twenty years of proven use, the cost is approximately $80 per gallon. The contact for this is JE Pritchett, of Superior Products International. The first four pictures are of the Super Therm Ceramic project, you will see the infrared heat gun measurement with standard paint compared to Super Therm coating to show the heat reflection characteristic.

By blending the two technologies for use on the buildings, it will result in an extremely cool and energy efficient, and sustainable design in the Sudan.

Let me know if you have any further
questions. Andy

Andy Middione, Major, USAF

Deputy Director, 309 Support Squadron

309 Aerospace Maintenance and Regeneration Group, DM
AFB Dsn 228-8396 Com 520-228-8396

OGDEN AIR LOGISTICS CENTER

Super Therm Ceramic for Aircraft Parking Area

Alternative Energy Technology

15 April 2011

Major Andy Middione
309 AMARG

U.S. AIR FORCE

BE AMERICA'S BEST

Presentation Page 1 - 8

SuperTherm and the US Air Force

Jim Williams, distributor in Tucson Arizona, arranged an on-base demonstration of SUPER THERM coated over a building and for me to make a presentation to the joint conference.

The building was a metal building without fiberglass and a drop ceiling. The day before the conference the temperature was 111F (44C) and the day of the conference when I spoke and everyone boarded buses to go and see SUPER THERM working was 113F (45C).

The key to this demonstration was that the air conditioning units were turned off for three days prior to the conference to show how well SUPER THERM could block the loading of heat onto the metal skin of the building.

Before the doors of this building were opened and people were invited to walk through (approximately two hundred people - 4 bus loads), I walked to the sun side of the building and touched the side to see what the temperature would be. It was ambient temperature.

After 60 or more people were inside the building and two doors locked open so that everyone could walk in and walk out, the temperature inside the building was approx. 85F (29C).

So, after three days with temperatures of 111F - 113F and with 60 people standing inside with two doors open during the review, the interior was only 85F. This is good by any gauge.

The attached letter came to us from Washington DC and the Deputy Assistant Secretary of the Air Force.

J.E.

The Assistant Secretary of the Air Force sent a letter to SPI in appreciation for the presentation and support of the Air Force Renewable Energy Symposium in Tucson.

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

4 August 2011

Mr. Joseph E. Pritchett
President and Chief Operating Officer,
Superior Products International II, Inc.
10835 W. 78th Street
Shawnee, Kansas 66214

Subject: Innovative Use of Ceramic Coatings to Alter the Approach to Building Heat Gain

Dear Mr. Pritchett,

I extend my personal thanks and appreciation for your support of the Air Force Renewable Energy Symposium in Tucson on June 28 and 29th. The Air Force is committed to be a leader in developing and using renewable energy to support our mission and reduce reliance on fossil fuels. We can only meet this objective with the involvement and support of a wide range of government, regulatory and renewable industry leadership. Your presentation on Innovative Use of Ceramic Coatings to Alter the Approach to Building Heat Gain was very informative and valuable to our efforts.

The Air Force energy team, including our senior staff here in the Secretariat, look forward to additional discussion with you and overcoming challenges in our movement to a clean, renewable energy future.

Sincerely,

KEVIN T. GEISS, PhD, SES
Deputy Assistant Secretary
of the Air Force, Energy

SUPER THERM is applied to buildings, aircraft to protect electronics, aircraft parking areas to reduce concrete heat loads under the planes and bridges. (Pictures attached in back of this specification report.).

FLIR Photographic Evaluation

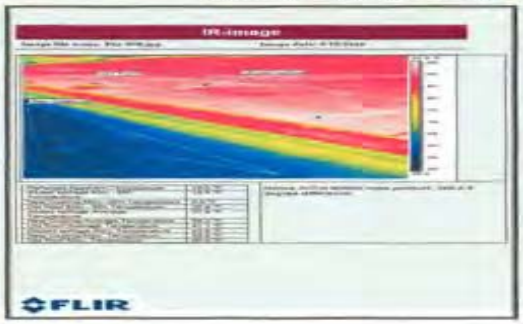
OGDEN AIR LOGISTICS CENTER

The aircraft parking area will be measured with infrared heat guns and photographed with a FLIR camera for heat reflection.

This picture shows a roof where the ceramic has been applied to half of the structure.

Super Therm Ceramic was successfully mixed into asphalt for city streets in Japan to reduce heat absorbed by the asphalt to reduce city air conditioning loads.

AFRL CTIO will conduct the test at AMARG and publish results



BE AMERICA'S BEST

3.

Alternate Aircraft Preservation Coating

OGDEN AIR LOGISTICS CENTER

- Air Force Research Lab will perform a one year accelerated test to provide four years of data
- On-site simultaneous actual testing here on A-10 , F-16, F-15, and NAVY F-18 aircraft

Anticipated Savings and Benefits:

- Reduce materials: $140 per 5 gallon container X 1300 containers per year = $180K+
- Reduce labor from 4 coat system to 2 coats using airless sprayers, TBD
- Reduce twice the heat loading on aircraft skin compared to current Spraylat--better for electronics

BE AMERICA'S BEST

19.

Super Therm Ceramic Coating for Building Exteriors

OGDEN AIR LOGISTICS CENTER

Area 23 Portable Office and Microturbine Enclosure Metal Exteriors painted with Super Therm Ceramic Heat Reflective Coating to reduce heat loading

BE AMERICA'S BEST

19.

UNITED STATES AIR FORCE

Super Therm Ceramic Coating for Building Exteriors

OGDEN AIR LOGISTICS CENTER

RESPONSE TO THE ABILITIES OF SUPER THERM®

US Air Force Renewable Energy Symposium

Usage areas of SUPER THERM® and a new APC STRIPABLE to be applied under SUPER THERM to allow the entire coating system to be removed in minutes to fly the craft.

Lt Col Andrew Middione Declaration of Facts

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

GEORGIA TECH UNIV.: An important test trial was performed at Georgia Tech Univ. in 2012 which involved establishing all the "R" rating machines and equipment into the field (outside a laboratory setting) to judge the heat blocking ability of SUPER THERM® compared to green roof settings and standard insulation materials to find the "R" value. After all equipment was set up and started, it was realized that none of the "R" value testing equipment could work in a real world environment. Changes in ambient temperature, humidity or wind will not allow the measuring devices to work and record properly. It was determined that "R" values can only be certified and evaluated in a "solid state environment" or simply a laboratory with has no changes in environment. This conclusion verifies the fact that "R" rated materials cannot function in real world conditions to the reported values it claimed in a laboratory setting and cannot carry this rating into the field usage.

GEORGIA TECH UNIVERSITY

Thermal Properties of Biological Skins, Jack Poole, Faculty Advisor: Dr. Jeanette Yen

Copied direct from report:

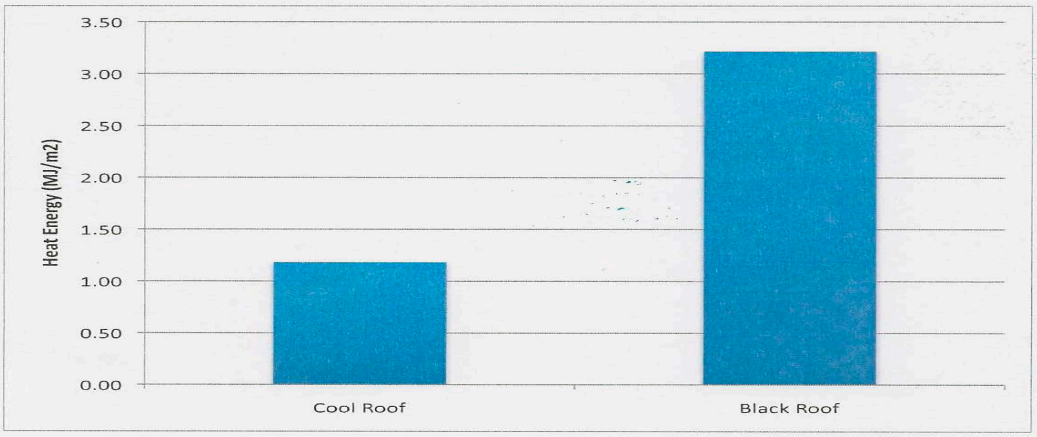


Figure 5: Roof Comparison, 10/22/2010 Data

Figure 5 illustrates that 1.2 MJ/m^2 of heat energy passed through the cool roof and 3.2 MJ/m^2 of heat energy passed through the black roof. The black roof let in 2.7 times more heat energy per square meter, as compared to the cool roof. With an ambient temperature of 86°F, the outdoor temperature is above the interior set-point temperature of a standard building. Therefore, the cool roof illustrates superior performance, as it allows a smaller amount of heat energy to pass through the roof system.

Objective:

The objective of this project was to study the thermal properties of biological skins. Three experimental roof set-ups were constructed including a black roof, a cool roof, and a green roof. Experimental equipment was used to measure and compare the thermal properties of these three roofs.

Note added by SPI: Mathematically, 1.2MJ/m2 passed through cool roof and 3.2MJ/m2 passed through uncoated roof. This is mathematically a 267% reduction in heat gain in the roof substrate.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

NASA: There are many coating companies claiming association with NASA for the development of a coating product. None can offer proof of this claim, no testing, no actual association with any NASA lab work and results or proof. SPI did work with the assistance of NASA lab personnel for testing and results and help in locating ceramic compounds from sources for JE Pritchett, the SPI researcher to do the trial and error R&D for now 33 years. J.E. was a featured speaker at the NASA technology conference in Chicago in 1995 on SUPER THERM.

Find the attached at the back of this report for the association claimed by SPI.

Stennis Space Center
Stress Photonics Inc.
Superior Products Intl

3:00 SUPER THERM Ceramic Coating Insulation

JE Pritchett, President, Superior Products Intl.

A water-borne coating spun off from NASA research has proven an outstanding insulator in harsh weathering conditions. Mr. Pritchett will outline how he worked with NASA to commercialize this technology & describe successful applications worldwide.

Medical Technology (part 1)

Moderator: Paul Bennett, Manager, Technical Marketing,

Federal Department of Energy has a "DOE WEATHERIZATION Assistance PROGRAM"

promoted by the Oak Ridge National Laboratory (ORNL) where they chose products to test and prove for low income homes saving energy use and cost. This is direct from the FEDERAL DOE and OAK RIDGE NATIONAL LABORATORY as seen in website below.

https://www.energy.gov/eere/wap/weatherization-assistance-program

https://weatherization.ornl.gov/

-- SHOWN BELOW:

Weatherization and Intergovernmental Programs Support

-

Weatherization Assistant

Read Our Overview

-

Publications

The Weatherization and Intergovernmental Programs Support is a part of the Oak Ridge National Laboratory's (ORNL's) Energy and Transportation Science Division and ORNL's Building Technologies Research and Integration Center. Our mission, in support of the US Department of Energy (DOE) Weatherization and Intergovernmental Programs Office, is to work with federal, state, and local partners to promote the adoption of energy efficiency and renewable energy technologies and practices, thereby helping the nation realize a stronger economy, a cleaner environment, and safer, more affordable energy services for all its citizens. Our activities include technical support for the Weatherization Assistant energy audit software tool, evaluations of the DOE Weatherization Assistance Program (WAP) and State Energy Program (SEP), and policy research in support of weatherization and low-income programs.

US DEPARTMENT OF ENERGY WEATHERIZATION PROGRAM

Testing on SUPER THERM® "Radiation Control Coating"

NATIONAL DOE WEATHERIZATION PROGRAM TESTING RESULTS

—Proving resistance of heat loading.

Results incorporated with

Radiation Control – Oak Ridge National Laboratory showing Emissivity, Heat Load resistance and energy savings

SUMMARY of DOE Test Results: **

*Ambient: 85°F. (29°C)

*ROOF without coating: 164°F (73°C)

*Roof coated with **SUPER THERM** : 86°F (30°C). (1°F over ambient)

*Roof coated with a white Elastomeric Reflective paint: 125°F (52°C)

*Interior ambient reduced: 10.2°F (6°C – 84F reduced to 74F)

*Upon the return to the home a week later, the owner told the auditors that she had never turned on the A/C because it was comfortable.

Attachments:

Google: Weatherization assistance program- US Dept of Energy The Weatherization Testing Report

ORNL(DOE Natl Lab) Building/tools/radiation-control for coatings

National DOE results**:

Interior temperature of home reduced by average of 10.2F when coated.

Exterior roof surface was reduced from 164F without SUPER THERM to 86F with an ambient of 85F or a 1 degree over ambient.

They compared these finding against our statement that we reduced the roof surface facing the sun within 5 degrees F of ambient. We were 1 Degree within ambient.

Given the average interior temperature reduction by the DOE team of 10.2 degrees F is a huge additional savings as an average.

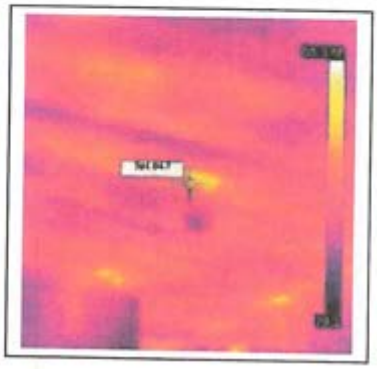
The National DOE Weatherization team confirmed the statement of 5 Degree drop on the surface after applying SUPER THERM.

The National DOE Weatherization team confirmed the statement of savings" by recording an average of 10.2 F drop in interior temperature related to the accepted ConEdison Energy Company savings calculation report. Actual savings on the Elderly woman's home could be more, because she never turned on her A/C after SUPER THERM® was applied as witnessed by the team.

Below is original report issued by the FEDERAL DEPT OF ENERGY AUDITORS:

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

BEFORE **84.7°F**



Kitchen ceiling on NW side

11.7°F differential

AFTER **73.0°F**

BEFORE **84.6°F**

Kitchen on west side

12.5°F differential

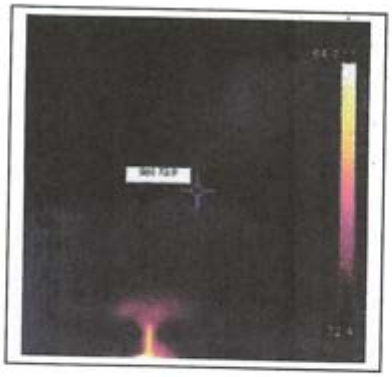
AFTER **72.1°F**

BEFORE **82.6°F**

Kitchen ceiling at center

9.7°F differential

AFTER **72.9°F**

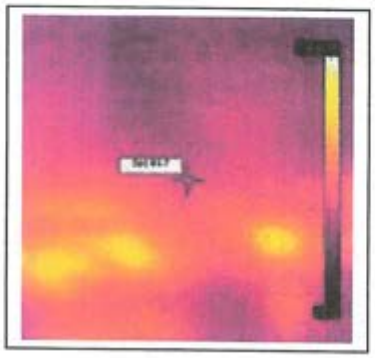


BEFORE **83.7°F**

Bathroom ceiling

9.9°F differential

AFTER **73.8°F**



BEFORE **83.6°F**

Living room SE ceiling

11.2°F differential

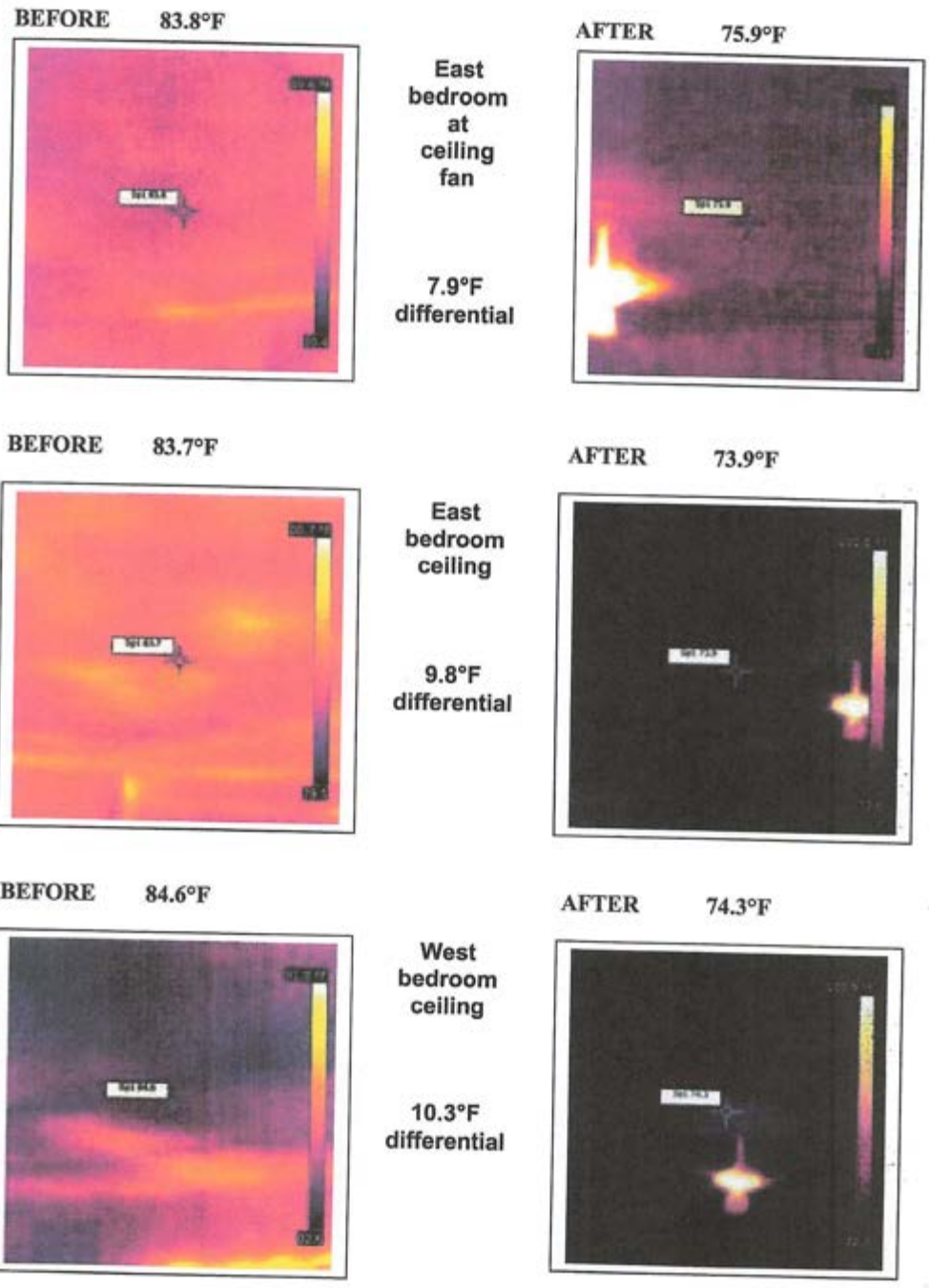
AFTER **72.4°F**

BEFORE **82.8°F**

Living room ceiling at center

8.7°F differential

AFTER **74.1°F**



From this directive, the Federal DOE did a "competent and reliable scientific evidence" study by their experts meeting the directive of the FTC RULE (revised 2020 edition), page 31 last paragraph.

Federal DOE Auditor's comments taken directly from the report on "checking the advertising statements" from Superior Products International II, Inc. to actual results are as follows (*)

* In addition to residents' security and comfort a specific intent is to reduce residents' utility bills. Page 1
* Recently, SJHP experimented with a new "green" product: SUPER THERM® - a liquid insulation that blocks the loading of solar heat on roofs. Page 1
* We applied SUPER THERM® to the 14X60-foot metal roof of an older single-wide mobile home and took comparison readings of "before" and "after" temperatures to see what impact this insulating product has on reducing interior temperatures and utility costs. Page 1
* The SJHP's interest in SUPER THERM® as an insulating paint was to test its promise of reducing heating and cooling costs by up to 70%. The manufacturer states that "SUPER THERM® blocks 95% of the three sources of heat: visual light, ultra-violet rays, and infrared rays. Page 2
* The surface temperature of a roof will always be within 5 degrees of ambient temperature once SUPER THERM® is applied. Page 2.
* To measure the effectiveness of SUPER THERM® for lowering interior temperatures, we took readings with an infrared camera. Because inside temperatures are claimed to drop within minutes, we took initial readings of a portion of the mobile home's roof painted with SUPER THERM® compared with a portion of the roof not painted. Page 2
* We saw an immediate drop of 7° F. Page 2
* The differential among the set of nine before-and-after photos ranged from 7.9 to 12.5 degrees Fahrenheit – an average reduction of 10.2° F. Page 2
* The exterior surface temperature of the mobile home's metal roof on a windy 85°Fday was 164°F. After application, the surface temperature dropped to 86°F. When we measured the roof surface temperature of a similar mobile home whose roof SFJP had coated with a white elastomeric product, the exterior surface temperature of that roof was 125°F.
* When SJHP weatherization auditors returned to the original mobile home a week after our experiment with SUPER THERM®, the owner reported that she had not turned on her A/C unit since the day the roof was coated. The interior temperature was comfortable, which offers a tremendous savings for this particular elderly mobile homeowner, who carefully watches her expenses in order to purchase necessary medications. Page 6
* Even without further readings, SJHP's assessment to date is that SUPER THERM® works well and meets our purpose and budget. Page 6
* We were very impressed with the immediate temperature changes after application. Page 6 last sentence.

Having the FEDERAL DOE (ORNL) do this testing with their experts, meets the "FTC Substantiation Policy".

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

Reflectivity Change with reflective coatings vs SUPER THERM -- TOKYO Japan

"International Workshop on Countermeasures to Urban Heat Island." "Rsearch on Cool Roof in Japan" by Mr. Yasushi Kondo, PhD of Musashi Institute of Technology. Dr. Kondo is a researcher with authority in the high reflectance coating field. There are many reflective coatings in the market today and which ones are reliable? In the test done by Dr. Kondo, the product No. 13 had on of its highest reflectance in the new stage, but only after one and half years (571 days) the reflectance had decreased by about 30%. Twenty one (21) high-reflectance coatings have been tested based on the JIS standard as a part of the heat island mitigation effect investigation program by the city of Tokyo. SUPER THERM was tested and compared to this study and found after 15 years (not 1.5 years) it had only dropped 8.4%.

Reflectivity change with aging of other reflective coatings

Twenty one high-reflectance coatings have been tested based on the JIS Standard as a part of the heat island mitigation effect investigation program by the city of Tokyo. The result of the newly applied product was publicly released before, but the result after it aged has just been released in the "International Workshop on Countermeasures to Urban Heat Island" in a presentation **"Research on Cool Roof in Japan"** by Mr. Yasushi Kondo, PhD of Musashi Institute of Technology. Dr. Kondo is a researcher with authority in the high reflectance coating field.

There are many high-reflectance coatings in the market nowadays, but not enough research has been done on its product quality. Therefore, it is difficult for users to select reliable products.

In the test done by Dr. Kondo, the product No.13 had one of its highest reflectance in the new stage, but only after one and a half years (571 days) the reflectance had decreased by about 30%.

<Product No.13>

	Solar Reflectance (300~2500nm)		Visible Light Reflectance (300~780nm)		Near-Infrared Reflectance (780~2500nm)	
	New	571 days	New	571 days	New	571 days
White	80.8 -	**54.8**	85.2 -	○ **50.4**	82.1	61.4
Black	40.4 -	30.7	5.8 -	3.) 6.9	71.2	51.5

Test Method: JIS R 3106 (Reflectance Test on Plate Glass)

On the contrary to this test result, Super Therm's reduction in reflectivity (Visible Light) after 15 years was only 8.1%. (92.2%- 84.1%=8.1%)

This result proves that Super Therm's durability in reflectivity is by far excellent.

<Super Therm>

2. The Solar Reflectance at the new stage was **92.2%** (Building Material Test Center)
3. The Solar Reflectance **After 15 years** (K-Teck, Kansas)

	Solar Reflectance (300~2500nm)	Visible Light Reflectance (300~780nm)	Near-Infrared Reflectance (780~2500nm)
White	73%	84.1%	67.1%

Test Method: JIS R 3106 (Reflectance Test on Plate Glass)

4. **The** reduction of solar reflectance in 3 years tested for the Energy Star Program by **EPA** was only **0.06%.**

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

Aramco Oil and Gas: Jyaymah NGL Spherial Tanks

In the Natural Gas tank fields, the sun radiation (UV, Visual and IR) waves heat the skin of the tanks causing a critical increase in psi pressure inside the tanks that causes flaring. Most all flaring is burned off with a constant flame. This, in itself, is dangerous and is a concern for the safety engineers more so than the loss of gas. SUPER THERM was applied to a full tank to compare directly to the identical tanks around it being the same size and shape. In November the ambient was 32C (90F). The uncoated tank surface was 50.9C (124F) while the SUPER THERM coated tank surface was 35.1C (95F) or near 30F surface temperature difference.
The SUPER THERM tank allowed the interior temperature to drop low enough to stop the blow-off or reduce the pressure to stop the flaring. This was very significant in employee protection but loss of gas.

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Mitsubishi Related Tank Terminal Feb. 10, 2010

39 storage tanks coated with fuel. The VOC emission in the atmosphere has been reduced strongly. Tanks are now cool and no evaporation.
Temperature inside tanks were controlled by electricity and water, but is not needed any more. COOL THERM (name in Japan) is the superior eco product which lessens the burden on the environment.

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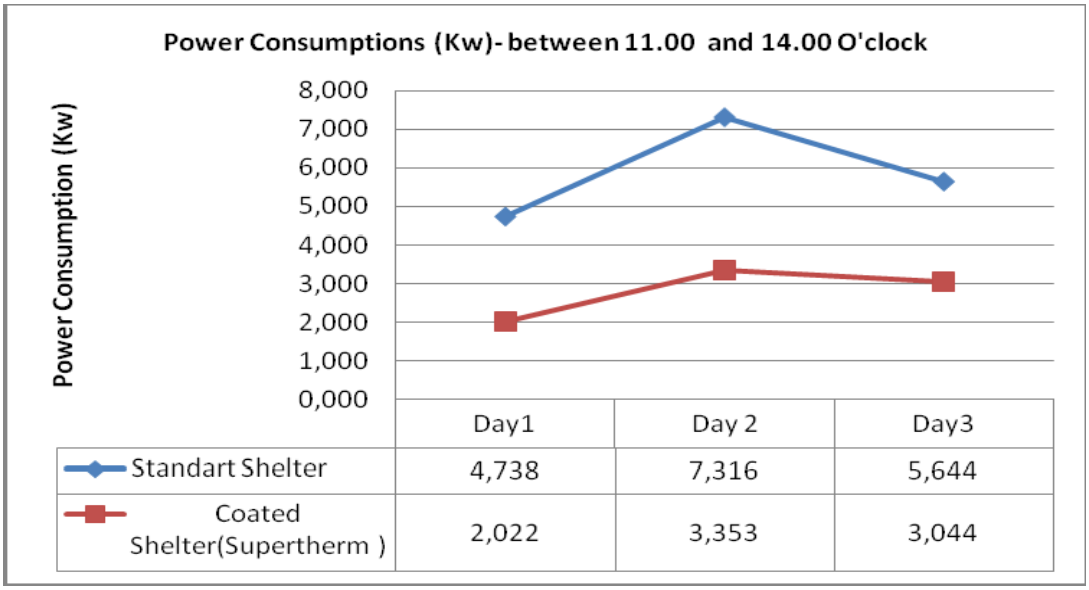
VODAPHONE TURKEY, MOBLE PHONE CONTAINERS

For transmitting the reception signal for mobile phones in Turkey, an air conditioned container is used. Problem is the heat will build up inside and cause problems with the electrical systems. They must be kept at 23C at all times and cost of A/C is high. Conclusion: Inside temp was achieve at 23C and average savings of energy was over 50%. NOTE: Your savings could be different.

Daily Results 11:00-14:00	Stand. Shelter Consumption kw	Coated Shelter Consumption kw	% Difference
Day1	4,738	2,022	57,3
Day 2	7,316	3,353	54,2
Day3	5,644	3,044	46,1
		Average	52,5



Comments

The charts and diagrams above show that during the 3 days trial the coated shelter consumed an average of 52 % less power compared to the standard shelter.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

Container Jails in El Savador

Metal containers used as Jails. Coated with 10 dry mils (250 microns) of SUPER THERM to block the heat load from heating the trailers.
Container without coating Wall 48.6C and Roof 58C, coated with SUPER THERM Wall 30.4C and Roof 27.8C.

"Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®'s application. Results may vary depending on these factors."

TESTING:

2.) Water Barrier Coating

ASTM D 6904 Resistance to Wind Driven Rain for Exterior Coatings
ASTM D 7088 Resistance to hydrostatic Pressure for Coatings

Passed all testing standard to 55 mph wind driven rain.

3.) Flame Spread Class A fire rating

ASTM E 84-89 "0" Flame Spread and "0" Smoke

4.) **Sound Reduction**

ASTM E90 “Standard Method for Laboratory measurement of Airborne Sound Transmission Loss of building Partitions.”
ASTM E413 “Standard Classification for Determination of sound Transmission Class.”
Both sides total accumulative result is STC 41
Talking range of 1000 Hz to 1600 Hz – STC 50 and again at 5000 Hz.

5.) **Mold / Mildew Resistance**

ASTM D-3273-82T tested for severe mold environment – Temp 90F and RH of 95%-98% for 5 ½ weeks. Rated 9 out of 10.

6.) **Condensation Control**

Field Study Testing

7.) **Static Coefficient of Friction** is an average of **1.14** when tested in 2007.
Kinetic Coefficient of Friction is and average of **0.78**.

8.) **Certifications:**

UL, ABS, ENERGY STAR, California Bureau of Home Furnishings and Thermal Insulation, ICC (International Code Council #21-25), CRRC (Cool Roof Rating Council – Emissivity of 0.91), JIS (Japanese Institute of Standards) A 5759. US GREEN BUILDING COUNCIL- Certified, LEED program, MBDC Cradle to Cradle Program – Certificates for LEED and Environment, USDA approval letter and US Consumer Council approved.

Testing Properties:

SuperTherm® Laboratory Tests:

1. ASTM (American Society for Testing and Materials):

- **ASTM B177** - Salt spray (fog) corrosion tests, 450h exposure (Pass

- **ASTM C177** - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus (Passed)

- **ASTM C236** - Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box - Testing for measuring R-values (Passed)
  ASTM C411 - Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation (Passed)

ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers (Passed)

- **ASTM C1549** - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer (Passed)

- **ASTM D412** - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers- Tension - Tensile strength - 444 psi, modulus of elasticity 13,248 psi (Passed)

- **ASTM D522** - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings (resistance to
  - cracking on metal or rubber type materials / 1"(25mm)bend / 1/4"(96mm)bend) (Passed)

- **ASTM D1653** - Standard Test Methods for Water Vapor Transmission of Organic Coating Films (Passed 3%)

  ASTM D1654 - Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments Salt spray (fog/weathering) 450 Hour Salt Spray (Fog) (Passed - 2000 hours)

- **ASTM D3273-82T** - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber (Passed)

- **ASTM D3274** - Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Microbial (Fungal or Algal) Growth or Soil and Dirt Accumulation (Rating degree of fungal growth or soil and dirt accumulation on paint film) (Passed - Excellent (8 out of 9))

  ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test (Rated: 5B)
  ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser (Passed)

- **ASTM D6904** - Standard Practice for Resistance to Wind-Driven Rain for Exterior Coatings Applied to Masonry (3000 cycles)

- **ASTM D7088** - Standard Practice for Resistance to Hydrostatic Pressure for Coatings Used in Below Grade Applications Applied to Masonry (Passed)

- **ASTM E84-89a** - Standard Test Method for Surface Burning Characteristics of Building Materials (Flame Index "0" / Smoke Index "0" - Class "A" Rating) (Passed - "0" development)
  ASTM E90 - Standard test method for laboratory measurement of airborne sound transmission loss of building partitions (Passed)

- **ASTM E96** - Standard Test Methods for Water Vapor Transmission of Materials water vapor transmission (Perm Rating - 8.8 avg)

- **ASTM E108** - Standard Test Method for Fire Tests of Roof Coverings (Passed)

- **ASTM E413** - Standard Classification for Determination of Sound Transmission Class (STC 40 to 50 based on sound frequency)

- **ASTM E514** - Standard Test Method for Water Penetration and Leakage Through Masonry Resistance to Wind Driven Rain (Passed)

  ASTM E903-96 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres (Passed)
  ASTM E903-96 - 4 Year Retest (Passed)

ASTM E1269 - Standard Test Method for Determining Specific Heat Capacity by Differential Scanning Calorimetry - TPRL (Passed)

ASTM E1461-92 - Standard Test Method for Thermal Diffusivity of Solids by the Flash Method (Passed)

ASTM G53 - exposure to UV, elevated temperature and humidity (Passed

5. NASA (National Aeronautics and Space Administration):

NHB 8060.1B/C Test 1- Flammability testing ("0" Burn, Class "A" rating) (Passed)

NHB 8060.1C, Test 7 - Toxic Off gassing ("K" no Toxic off gassing / "K" Rating for toxicity)

6. ICC (International Code Council):

Council that formally consolidates approvals for:

BOCA (Building Officials Code Administrators)

Section 723.2 Exposed installations, Thermal insulation
Section 723.3 Concealed installations, Thermal insulation
Section 803.2 Classification, Interior finish

1998 International Mechanical Code

Section 604.3 Coverings and Linings, Insulation

ICBO (International Conference of Building Officials

*** SBCCI (Southern Building Code Congress International)**

Passed ASTM E 84 For Flame Spread

Passed ASTM C 411 for High Temperature for Surface Performance
Section 803.2 Classification, Interior finish

Passed ASTM C 177 for Thermal Conductivity

5. ECAP-CUL-1-03 - ENERGY CONSERVATION ASSISTANCE PROGRAM:

Standard Method for Comparing Utility Loads in Standard Constructed Buildings

* FLORIDA: ECAP REPORT (report available on request)

* DENVER: ECAP REPORT (report available on request)
  - *"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."*
    Alexander Othmer - Director FEO Energy Conservation Assistance / USF Tampa, Florida

* TEXAS: Container ECAP Report Houston (report available on request)
  - *"This is the third time we have had the pleasure to test SuperTherm product, it is rare that a single product will show such Repeatable Results in three totally different environments, South Florida and Denver Colorado and LaPorte Texas a true testimonial to your products ENERGY STAR rating."*

4. ASHRAE (The American Society of Heating, Refrigerating and Air-Conditioning Engineers):

90.1 CODE COMPLIANCE ("U" value used to measure "area-weighted average", insulated walls or roofs)

6. ENERGY STAR PROGRAM:
Approved and accepted as an energy star partner for saving energyASTM E 903-96 Reflectivity = 84% Only 1% Reduction in Reflectivity over 3 Years (3% over 10 years) ASTM C 1371 and C 1549 Solar Reflectance and Thermal Emittance

7. LEED (Leadership in Energy & Environmental Design):

Qualifies under Sustainable Sites Credit 7.1 Heat Island Effect - non roof (1 point)

Qualifies under Sustainable Sites Credit 7.2 Heat Island Effect - roof (1 point)

- Qualifies under Energy and Atmosphere Credit 1 Optimize Energy Performance ie. reduce thermal bridging (1-10 point)
- Indoor Environmental Quality Credit 4.2 Low Emitting Materials - paint (1 point)
- Innovation & Design Process Credit 1.1 Innovation in Design (5 point)
- Under Category **CORE AND SHELL** in the latest 2009 LEED program:
  - SS Credit 7.2 Heat Island Effect: Roof - 1 point for having a SRI above 78 (ST-120)
  - EA Credit 1: Optimize Energy Performance 1-21 Points SUPER THERM – 17 points.
- MBDC Cradle to Cradle **GOLD CERTIFICATION**
- LEED Rating System (available upon request)

8. DNV (Det Norske Veritas):

DNV Certification **for SuperTherm®** (available upon request)

- Passed DNV Audit and DNV Compliant
- Approved for worldwide salt water and Maritime use
- Complies with DNV's Interpretation of SOLAS 1974 Convention as Amended Low Flame Spread material, not generating excessive quantities of smoke nor toxic products in fire
- DNV rules for Classifications of Ships and Mobile Offshore Units

9. JISC (Japanese Industrial Standards Corporation):

- JIS A 5759 Reflectivity of sunlight on window or coating film (Passed) Reflective ratio 92.2 - Long Wave Radiation ratio 99.5 (Infrared) (Passed) 15 Year Re Test Solar Reflectance JIS R 3106 (Passed)

10. USDA (United States Department of Agriculture):

- Environmentally safe and safe for use around animals
- Letter of Written Certification as Accepted by USDA from Manufacturer (available upon request)

11. China Center for Technical Testing of Non-Metallic Materials for Ship Building, China Ship-Building Corporation:

- National Bureau for the Inspection of Technologies (97), Measurement Approval (National) No. (M0729) (Passed - 2000 hours)
- GB/T 1771-91 - Resistance to Salt Fog (2000 hours) (Passed)
- GB/T 1866-88 - Manual Aging (2000 hours) (Passed)
- GB/T 10834-88 - Resistance to Salt Water (1000 hours) (Passed)
- GB/T 5219-85 - Adhesion (pulling apart method) (4.07MPa)
- GB/T 1733-93 - Boiling Water Immersion (8 Hours)

12. IMO (International Marine Organization):

- IMO A. 653 (16) - Flame Spread Test for Bulkhead, Wall, and Ceiling Linings (Passed)

13. Marine Safety Council:

- MSC.41 (64) - Toxic Gas Generation, Used Colorimetric Gas Detector Tubes, Met All Toxic Gas Requirements (Passed)

14. SOUND PROOFING Barrier:

-
- Sound Reduction: STC (Sound Transmission Coefficient)-Rated 48-51 per ASTM E 90 Stoughton Trailer Ultra Sound testing shows a 68% Reduction
- Sound testing performed by Hot-Cold Air and Fire Control by Pat Saulson, PhD
- Sound reduced an average of 50.2% by using SuperTherm® on the interior walls of a house

15. VOC – 24 grams/ litre

16. USDA (US Dept. of Agriculture) approved for use around foods- no off gassing.

17.

18. GREEN LABEL

- "Certified" means that an examination of samples of a Product or investigation has been performed by the Council to determine compliance with the Guidelines and that permission has been granted in accordance with this Agreement for the User to represent its Product as Certified.

19. US FEDERAL AUTHORIZED VENDOR AND CONTRACTOR APPROVAL STAMP FOR SELLING DIRECTLY TO US GOVERNMENT AGENCIES AND MILITARY

Complete System for Award Management Assitance

Let your customers and government procurement officers know that you are registered in SAM with our "Verified Vendor" seal. Just like an association or license seal, with this seal you can show interested clients that you are a registered vendor on your website, letterhead, email or other correspondence.

For more information on SPI Products, please send us an email at info@spicoatings.com or phone us at 913-963-4848. SPI products are manufactured in the USA in Shawnee, Kansas.

Prep: Surface must be clean and dry for application.
If any existing surface is glossy, this must be sanded to dull the surface and have no gloss showing.
Oils and residues of any kind must be Power Washed using a Citrus cleaner or any cleaner that can stripe oils and residues and leave the surface clean with no surface residue.
Do not use Degreasers as a cleaning agent. These leave oil films and residues when dried.
If rust is showing, use RUST GRIP (single component urethane) as the primer to encapsulate the rust before applying SUPER THERM.
If pack rust or scale is present, SP 6 must be used to blast the rust down to only a surface rust of 1-2mm thickness, dried completely and RUST GRIP applied at

14sq.m per gallon (3.5 sq.m per litre). Then SUPER THERM applied over the RUST GRIP.

NOTES:

SUPER THERM is designed specifically to block radiation heat from “LOADING” onto the surface of the tank. This blocking of heat load, stabilizes the tank surface, the coating does not expand and contract because it cannot load the heat. There is not cracking and peeling over time.
SUPER THERM is a water barrier (not just a moisture barrier) to block and stop any moisture from humid air or rains from touching the surface of the tank surface to prevent any development of corrosion. With a permeability of 8.8, the SUPER THERM can breathe air, but not allow moisture to enter and bring moist air to the surface.

Below are pictured IR shots of roofing coated and before coating with SUPER THERM. Additional pictures are from US Air Force and NASA.

“Super Therm® works by reflecting and not absorbing solar heat. The results achieved in this [test/field report] are unique to the structure, geographic location, weather conditions, and time period of Super Therm®’s application. Results may vary depending on these factors.”

Strictly Thermal

Tuned Coatings, LLC
Steffen Mehnert, Mgr
8006 E Arapahoe Rd #10
Centennial, CO 80112

www.tunedcoatings.com

This report is an initial examination of the roofing materials being applied to a large office building in Lakewood, CO

This is an initial report with no controlled samples or environment. We would ask to complete that in a controlled environment to ascertain more accurate numbers.

However, we are certain of a large percentage decrease in thermal heating due to the application of the product. It also appears it has been applied in a consistent and accurate manner as the images reveal.

The images were obtained 12 May 2010 from 1:05 to 1:25 pm MST
Ambient air temp: 62 degrees F
Humidity: 27%
Wind speed: Avg 11 MPH, Max 16.9 MPH from the NNW.

STRICTLY THERMAL LLC

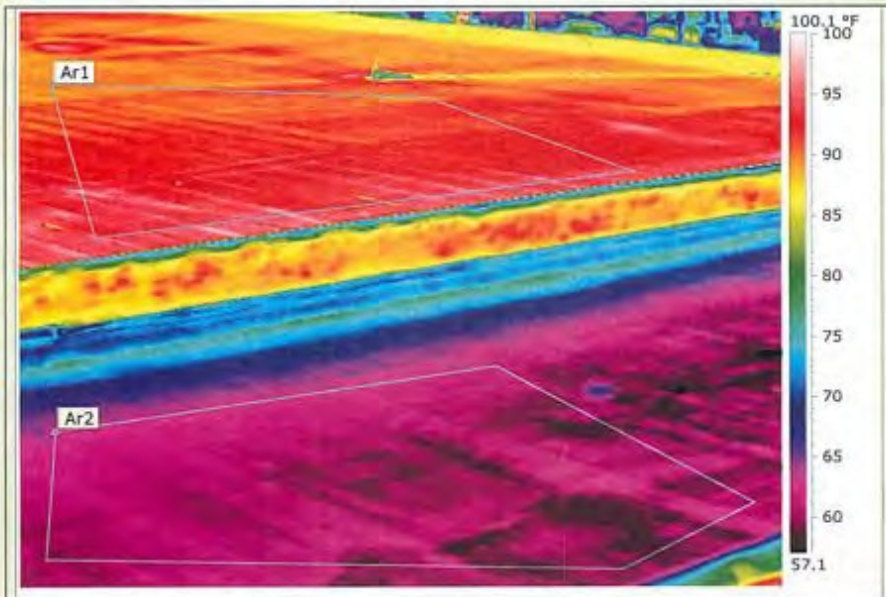
FLIR

1153 BERGEN PARKWAY, STE M254
EVERGREEN, CO 80439
www.strictlythermal.com
Office: 303-674-1803

Fax: 303-674-7712

IR-image

Image file name: Flir 001.jpg **Image date: 5/10/2010**



Reflected Apparent Temperature	68.0 °F
Image Time	1:10:46 PM
Ar1 Min. Temperature	86.4 °F
Ar2 Min. Temperature	56.6 °F
Ar1 Max - Min Temperature	13.4 °F
Ar2 Max - Min Temperature	7.2 °F
Ar1 Average Temperature	93.6 °F
Ar2 Average Temperature	60.1 °F

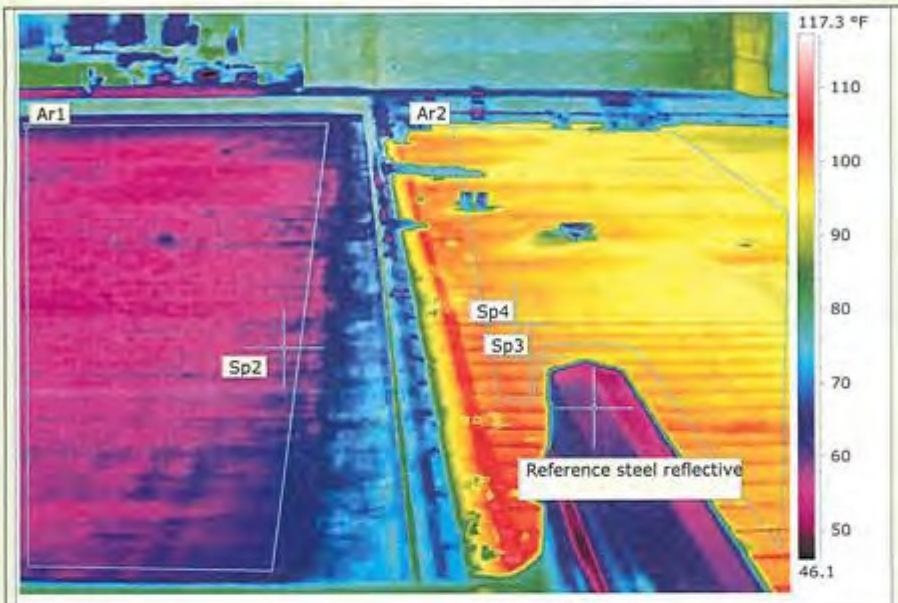
Looking north onto lower roof.
The diagonal yellow area is a raised firebreak wall.
Smoothness and consistency of the coating is apparent.

The apparent average temperature difference from Ar1 (old roof) to Ar2 (New Coating) is 33.3 degrees.
Also the Delta Temp (High to Low difference) Is 6.2 degrees narrower.

FLIR

IR-image

Image file name: Flir 003.jpg **Image date: 5/10/2010**



Reflected Apparent Temperature	78.0 °F
Emissivity	0.91
Relative Humidity	27.0 %
Reference steel reflective Temperature	61.4 °F
Sp2 Temperature	61.3 °F
Sp3 Temperature	98.2 °F
Sp4 Temperature	99.9 °F
Ar1 Min. Temperature	47.4 °F
Ar2 Min. Temperature	48.8 °F
Ar1 Max - Min Temperature	14.5 °F
Ar2 Max - Min Temperature	50.9 °F
Ar1 Average Temperature	53.8 °F
Ar2 Average Temperature	91.5 °F
Ar1 Max. Temperature	61.9 °F
Ar2 Max. Temperature	99.6 °F

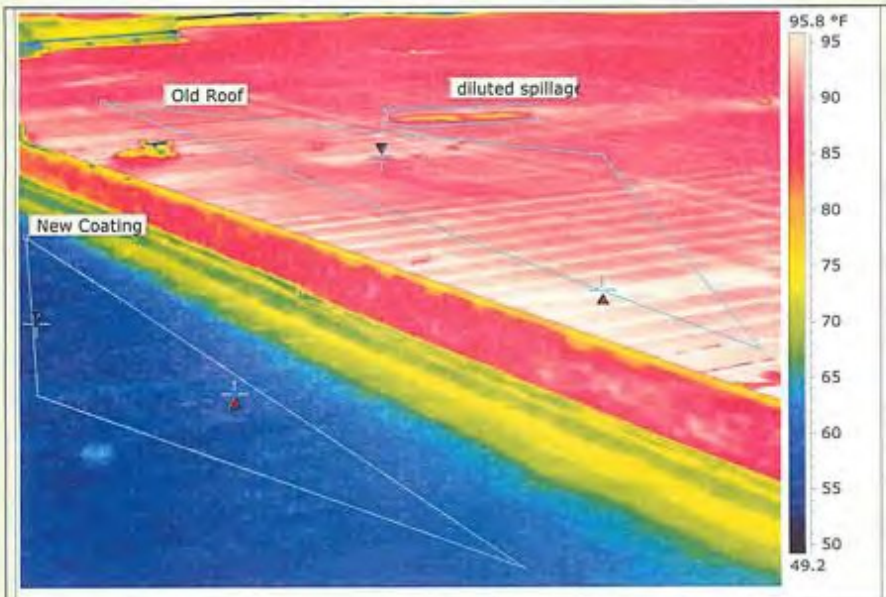
No control sample. Suspected .91 emissivity
Distance approximated.
No measurements made under roof.
Need sample and angles for comparative measurement.
1 degree rise between laps on right side roof (Sp3 and Sp4)

That being said, a 37.7 difference (Delta) is impressive and in line with the other measurements indicated.

FLIR

IR-image

Image file name: Flir 008.jpg **Image date: 5/10/2010**



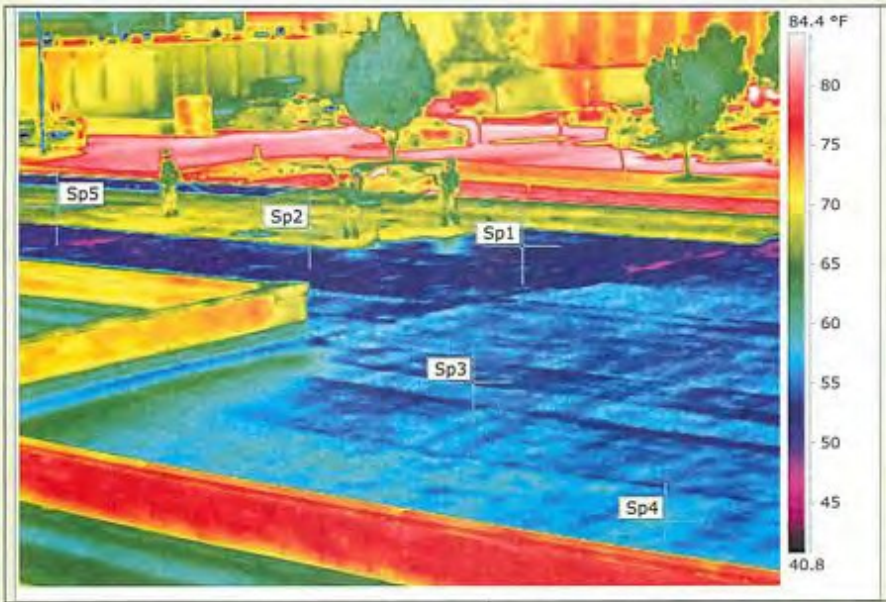
Reflected Apparent Temperature	78.0 °F
diluted spillage Max - Min Temperature	18.4 °F
New Coating Max - Min Temperature	9.0 °F
Old Roof Max - Min Temperature	20.9 °F
diluted spillage Average Temperature	87.9 °F
New Coating Average Temperature	59.0 °F
Old Roof Average Temperature	91.1 °F
Diluted spillage Max. Temperature	93.9 °F
New Coating Max. Temperature	63.5 °F
Old Roof Max. Temperature	99.0 °F

Notice Ar3 is spilled rinse product. Still a 6 degree difference.

FLIR

IR-image

Image file name: Flir 011.jpg **Image date: 5/10/2010**



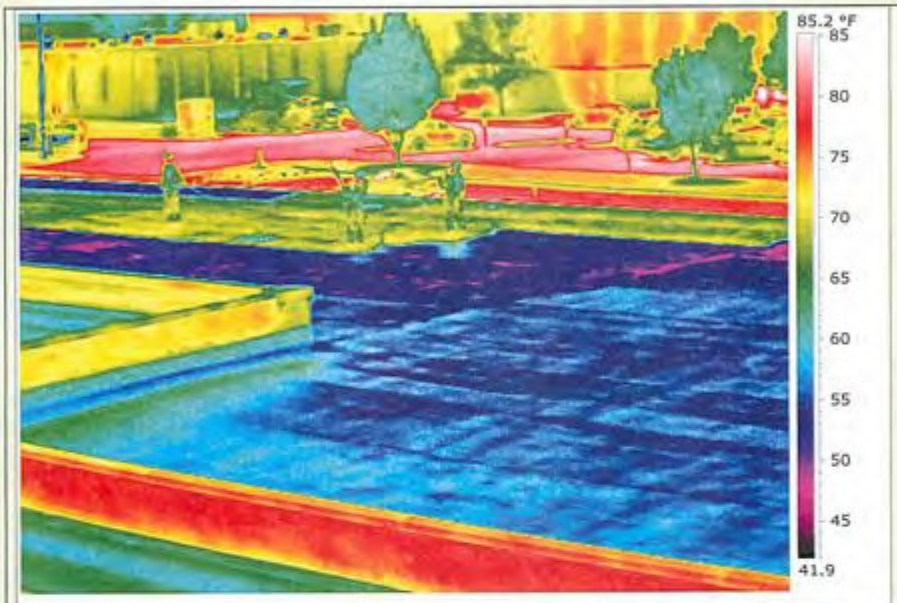
Reflected Apparent Temperature	68.0 °F
Sp1 Temperature	54.0 °F
Sp2 Temperature	69.0 °F
Sp3 Temperature	53.5 °F
Sp4 Temperature	58.4 °F
Sp5 Temperature	65.8 °F

Employees applying material, west side of building.
Notice temperature reading just before and after application Sp1 & Sp2.
Temperature readings appear consistent as the material cures.

FLIR

IR-image

Image file name: Flir 011.jpg **Image date: 5/10/2010**



Reflected Apparent Temperature	68.0 °F

Sample image to use without annotations.

FLIR

NASA Association with SPI, J.E. Pritchett NASA Technology Conference in Chicago in 1995

NASA Rolls Out Its Best New Technologies For Transfer

TECHNOLOGY 2005

3:00 SUPER THERM Ceramic Coating Insulation

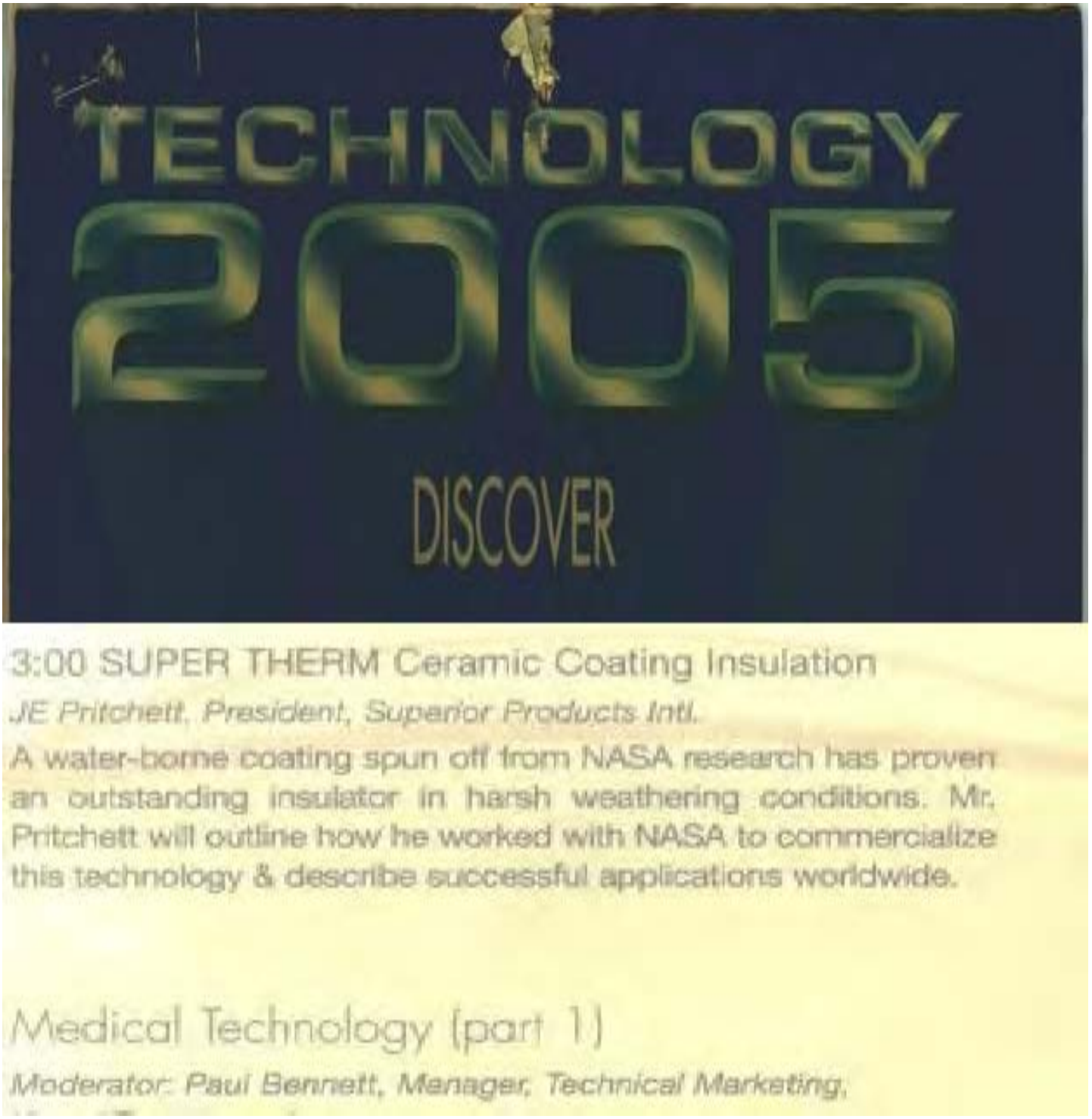
JE Pritchett, President, Superior Products Intl.

A water-borne coating spun off from NASA research has proven an outstanding insulator in harsh weathering conditions. Mr. Pritchett will outline how he worked with NASA to commercialize this technology & describe successful applications worldwide.

Medical Technology (part 1)

Moderator: Paul Bennett, Manager, Technical Marketing,

Super Therm Insulation Thermal Ceramics coatings means no heat load! Try standing on a metal roof with a heat reflective paint and you'll know the difference. It's getting hot out there in Australia...Super Therm will make a major difference to blocking heat load on buses, trucks, reefers and much more.



INSULATION Types: "Clarification"

1. **Conduction (absorb and transfer),** The R and U measures the absorption speed in which the heat transfers through the insulation material to the cool side. These values are made based on conductivity and thickness. Must have thickness to slow the time for the heat to absorb and transfer. The thicker the material, supposedly, the longer it takes for the heat to transfer to the cool side. The problem with this method is that it was tested as per ASTM testing on 75F on the hot side and the cool side is 25F. This is the only temperature approved by the testing and Federal oversight as the average temperature that represents all climates??? The hotter the hot side becomes above or even below the ambient and given these materials absorb moisture

2. then according to ASHRAE (American Society of Heat and A/C Engineers) studies, above ambient can result in 115 times lose in the R value. In the same study, below ambient and accounting for the humidity in the materials can result in 17 times lose in the R value. Considering the humidity trapped inside the insulation materials, "…above ambient applications, the insulation is not only rendered useless, but the net energy loss actually can be greater than if there were no insulation at all (Insulation.org ASHRAE Research Project 721– Gordon H. Hart P.E. ARTEK Engineering, LLC. With 30 years working in the insulation industry and problems with humidity loading into the materials).

3. **Reflective (to reflect mostly visual and UV waves until the surface film fades or becomes dirty).** "Twenty-One high-reflectance coatings have been tested based on the JIS Standard as a part of the heat island mitigation effect investigation program by the city of Tokyo. "International Workshop on Countermeasures to Urban Heat Island" in a presentation "Research on Cool Roof in Japan" by Mr. Yasushi Kondo, PhD of Musashi Institute of Technology. Dr. Kondo is a researcher with authority in the high reflectance coating field. In the test done by Dr. Kondo, the product No. 13 had one of its highest reflectance in the new stage, but only after one and a half years (571 days) the reflectance had decreased by about 30%.
SUPER THERM was compared to these 21 reflective coatings and after 15 years, the reflectivity drop was only 8.1% (92.2% to 84.1%). A re-check of a test roof in Western Kansas monitored by the Japanese and SPI for 30 years shows no further drop in performance nor loss of thickness in the coating film.

4. **HEAT BLOCKING** (built with the correct ceramic compounds that will not absorb nor load radiation heat waves and continues to perform when dirty). **HEAT BLOCKING** is the newest technology in controlling heat load from radiation heat and reducing the level of heat "available for transfer" to the cool side. After 30 years of ceramic compound study, the correct compounds were discovered (4,000 compounds researched) to find the 12 compounds that would continue to work in a coating formula, applied, dried and perform. NASA did have a part in this development by helping with the ceramic compound suppliers to be contacted for samples. SPI was the research lab to determine the compounds ability to perform (NASA invited J.E. Pritchett to speak at their Technology Conference about **SUPER THERM** in 1995). As a compound was discovered to perform alone, it was blended with other performing compounds to form the formula blend in **SUPER THERM**. When the correct compounds are blended and facing the radiation waves of the sun, they can refract, bend and repel the heat waves. The UV, Short Wave and Long Wave are all in the heat wave mix to block from loading initially onto the surface.

IF A HEAT WAVE IS BLOCKED, the heat load is reduced by the amount of heat blocked (see below blocking 99%). This reduction in heat can easily be achieved with a single coat at 10 dry mils (250 microns) of coating when the correct balance of ceramic compounds are used. This was taken to certified labs for ASTM testing before marketed to substantiate the performance ability**.**

ANY COATING or material* needing thicknesses one inch or more for standard ambient temperatures to give effective insulation is not

based on ceramic compounds designed to catch and block all three of the sun's initial heat waves hitting the surface facing the sun. *Exception is blankets made of beads.

Final statement on Reflectivity and Emissivity:

Reflectivity is based on light bounce. Our US ASTM tests are not as sophisticated as Japan Building Materials or Russian Academy of Sciences in judging the range of energy waves hitting the target . This is why I did testing with both.
Emissivity is based on a single point or scattered but using a handheld monitor gives what they believe to be a "heat" reading. ASTM C 1371-04 is the scattered method we used to be more correct.
Understand what emissivity is:
Emissivity is based on a black box. A black box set in the sun absorbs 100% of the heat to a point that it equalizes itself by giving off 100% of the absorbed heat back to the atmosphere, meaning it holds all the heat and on touch you feel the 100% heat on the surface. It conducts 100% of the heat absorbed also. With this understanding, all the emissivity readings being made are based on the black box "throwing off heat at 100%" and therefore all the ASTM testing is based purely on the heat being thrown off the surface. The assumption of the test is that as the heat tries to absorb into the surface the emissivity is the amount of this heat being thrown off. The higher the number the better.
The fallacy on this assumption is that the amount of the emissivity is the amount of heat not absorbed and therefore, released back to the atmosphere meaning if the emissivity is .91, then 91% of the heat that tried to absorb into the surface never absorbed and it was thrown off.
Go back to the black box, it absorbed 100% of the heat which did transfer to the cool side, while the 100% of heat in the black surface was released in an equilibrium back to the atmosphere that you can feel on touching the surface.
So, the point is this: Does recording a high emissivity number on the surface mean (according to the black box) you absorbed (example the .91) 91% of the heat and you are simply releasing in an equilibrium back to the atmosphere while the 91% also transferred to the cool side?? -Based on the black box effect.

My point: SUPER THERM is made from ceramic research performed with SPI and NASA between 1989-1995 studying the effects of "HEAT LOAD". Reflectivity was part of the effect of throwing off visual light mainly and trying to cool the surface somewhat. Emissivity was not part of this at all. This was proposed later by well-intentioned researchers to find a method showing how much heat could be measured being thrown off a surface after the heat begin to absorb into said surface. What I learned with NASA and I being the researcher was that what is important is how much heat absorbs and transfers to the cool side. Ceramic compounds designed or developed to specifically "block heat load" outperforms any measures of reflectivity and emissivity being tested and produced. We are talking about heat not light bounce or wave bounce. A white paint has a 70 reflectivity and emissivity or higher. A white car hood on a 90F+ day will burn your hand if you touch it. Wait- if the reflectivity and emissivity is showing 70%, then this should not be as hot as a piece of metal uncoated beside it. The visual light bounce is light - not heat. The emissivity is a measure of waves that represent heat but does not block heat and the metal under the white paint heated up within 30degrees as much as a black car hood.
HEAT WAVES: UV - 3% of the radiation heat, Visual Light or short wave is 40% of the radiation heat and Infrared or IR long waves is 57% of the radiation heat.
The testing of "reflectivity" does not account for all the IR waves. I worked with the labs performing the ASTM testing and this was a fact.

This is why I did the testing with the Japanese Building Materials lab to find out the ability of SUPER THERM to thrown off IR (57% of the heat) off the surface. Result: 99.5%. and visual light 92%.
This is why I did additional testing with the Russian Academy of Sciences to find the true reflectivity number for all waves using sophisticated equipment as seen in the test report and compared to known heat repelling surfaces.

To accept the US ASTM test results as gospel I found is a bad mistake. The argument between engineers and researchers on test results and which tests are the best is non-sense to me because they limit themselves to only what is in front of them.

As a last example of "heat blocking" is the testing performed by the FEDERAL DOE when they bought SUPER THERM to test on a roof in Florida to specifically check out our advertised statements. They say this in their report. They found that all we said was true and better than they expected. We kept a roof surface to within one degree F of the ambient temperature. Here is the important part, SUPER THERM made an average of 10.2F drop in temperature inside the home. This is the proof of performance, not some reflectivity or emissivity number.

With the attachments, the explanation of 34 years studying heat effects and there is still doubt about SUPER THERM, then we cannot help.

J.E.