



## TESTS & CERTIFICATIONS

**THERMO-SHIELD HAS BEEN WIDELY TESTED IN ACCREDITED LABORATORIES AND IN ACTUAL FIELD-TESTS.**

### THERMO-SHIELD ROOF COATING RESULTS ON AMERICA'S ASTM TESTS

TENSILE STRENGTH Tensile stress at 25% elongation Tensile strength at break	ASTM D-412 525 psi 615 psi elongation 70%
DETERIORATION BY HEATING IN AIR (Tensile strength after heating 21 days at 150° C)	ASTM D-865
Tensile stress at 25% elongation Tensile strength at break	515 psi 640 psi elongation 85%
<b>IMPORTANT:</b> These two tests show THERMO-SHIELD ROOF COATING ACTUALLY GETS STRONGER AND MORE DURABLE WITH AGING	
WATER VAPOR PERMEABILITY AND PERMEABILTIY	ASTM D-1653 ASTM E-96
Both tests show ROOF COATING with 8.8 perm in. rating. This is excellent Permeability: it has 160 times more than one of our main competitors claiming the same properties.	
WATER ABSORPTION	ASTM D-570
After water saturation for 5 weeks "NO CHANGES IN APPEARANCE ON ROOF COATING AFFER RECONDITONING". IMPORTANT! The above 3 tests show ROOF COATING will stand up to ponding water, yet has the ability to BREATHE OUT trapped water vapor when weather conditions are dry - WATERPROOFING WITHOUT BLISTERING	
BRITTLENESS	ASTM D-746
ROOF COATING passed the 90° bend test at -37° C. FLEXIBLE AT VERY COLD TEMPERATURES	
SURFACE OZONE CRACKING	ASTM D-1149
70-DAY EXPOSURE TO OZONE, Time to failure, "NONE OBSERVED IN DURATION OF TEST"	
CHEMICAL RESISTANCE	ASTMD-1380
16-hour spot test to 26 harsh or staining chemicals. ROOF COATING blistered only with some	

concentrated acids, stained only with gasoline, aircraft hydraulic fluid, and lipstick. ROOF COATING undamaged by animal urine, battery acid, bleach, de-icing chemical, 40% salt solution and others.

STEADY STATE HEAT FLUX MEASUREMENTS AND THERMAL TRANSMISSION PROPERTIES	ASTM C-177 / ASTM C-1045
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ROOF COATING (at 5-MIL thickness) K Value 0.0454 (R 22) NOTE: Some specialists say the ASTM formula for R Values in this test "R = 1/K" is oversimplified, and does not take enough information into consideration.

### **JAPANESE INDUSTRIAL STANDARDS TESTS "JIS"**

(Materials must pass strict limits on these tests before they can be sold on the Japanese market) THERMO-SHIELD ROOFING, INTERIOR AND EXTERIOR COATINGS have all passed the required tests:

LOW TEMPERATURE STABILITY	JIS A 6906 (1984) 5.5
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RESISTANCE TO CRACKING DURING CURING AND DRYING STAGE	JIS A 6906 (1984) 5.7
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ADHESION STRENGTH TEST	JIS A 6909 (1984) 5.8
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Normal Condition Test, THERMO-SHIELD has 3 times the minimum requirement for Adhesion. After Saturation Test, THERMO-SHIELD had 8 times the minimum requirement for Adhesion.

REPEATED TEMPERATURE CHANGE ***No peeling, cracking, blistering, discoloration or dullness***	JIS A 6909 (1984) 5.9
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TEST FOR WATERPROOF ***Maximum to pass test is 1.0 CM rating, THERMO-SHIELD WAS 0.1 CM TEN TIMES better than required***	JIS A6909 (1984) 5.10
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WASHABILITY	JIS A6909 (1984) 5.11
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IMPACT; SHOCK TEST ***Did not crack, peel, nor change shape or form under impact***	JIS A6909 (1984) 5.12
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AKALINITY TEST ***Did not crack, blister, peel, gum, change color or dull***	JIS A6909 (1984) 5.13.2
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RESISTANCE TO WEATHER & CLIMATE ***Did not crack, peel or discolor to minimum scale color of #3*** THERMO-SHIELD maintained a 4-5 scale, EXCELLENT, best of any paint tested by the Japanese National Testing Lab.	JIS A 6909 (1984) 5.14
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FIRE RESISTANCE TEST - CLASS 1 ***Did not fuse, crevice, change form or bow when cooled. Flame Retention: No flame to remain over 30 seconds after heating is stopped. THERMO-SHIELD Retention was 0.00***	JIS A 1321
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<p><b>UNDERWRITERS LABORATORIES</b></p>	<p>ASTM E-108 "FIRE TESTS OF ROOF COVERINGS Results: Flying Brands Produced: None Deck Exposure: None Lateral Flame Spread: None</p>
<p>Under UL File reference "R12343, THERMO-SHIELD ROOF COATING is available with a CLASS A fire resistant rating. NOTE: This is a special "Class-A formula", not our standard Formula.</p>	

**HAUSER LABORATORIES TESTS** - Comparison of heat transfer through THERMO-SHIELD vs. other common coatings:

1. THERMO-SHIELD INTERIOR PAINT heat transfer 0.871 BTU/hr Sq.-Ft., white paint heat transfer 1.163 BTU/hr Sq.-Ft (Normal white paint allowed 25% more heat to pass through).
2. THERMO-SHIELD ROOF COATING Solar heat transfer 6.1 BTU/hr Sq.-Ft., Black Asphalt solar heat transfer 38.1 BTU/hr Sq.-Ft. (Asphalt allowed 84% more heat to pass through).
3. THERMO-SHIELD ROOF COATING .005"-thick (5-mil = .127MM) painted on galvanized steel - solar heat transfer 17.2 BTU/hr Sq.-Ft. Untreated Galvanized Steel -heat transfer 48.0 BTU/hr Sq.-Ft (64% more heat pass through)

HEMISPHERICAL LIGHT REFLECTANCE

DSET Test 89r12 1001

Test on THERMO-SHIELD WHITE ROOF COATING, it reflected 82% of the solar light (88% of S-VISUAL LIGHT and 84% of NIR "Near Infra Red", the portions of light that account for heat - Reflectance of other typical roof systems: Dark pea gravel 12% - Light pea gravel 34% - gravel coated asphalt 23% - black roof 5% - dark gray 15% - white paint 55% - aluminum 40% - aluminum fiber coating 36% - white asphalt shingles 30% - SPM-60 (EPDM) 11%. (THERMO-SHIELD Reflects 49% more than 2nd best, white paint. SOLAR HEAT THAT

DOES NOT GET INTO THE BUILDING, DOES NOT BECOME A PROBLEM.

WATER EXTRACTABLES - SIMULATION OF ENVIRONMENTAL LEACHING

ROOF COATING leachables are composed of common (non-toxic) elements, predominately Calcium salts.

**FIELD TESTS OF THERMO-SHIELD INSULATING VALUE**

JAPANESE TESTS ON 8-TON CAPACITY FIBERGLAS FEED STORAGE TANKS

The interior of the THERMO-SHIELD coated tank stayed about 40° F cooler during the daytime.

ST. LOUIS COMPARISON TESTS ON THREE HOUSES, ONE WAS PAINTED WITH THERMO-SHIELD EXTERIOR PAINT.

After one year, the THERMO-SHIELD house showed 41.6% less electrical consumption.

FLORIDA HOME WITH THERMO-SHIELD ROOFING

Before coating, daily temperatures in the attic averaged 125° F, with outside temperatures of 87° F. After coating the roof, the attic temperature dropped to 95° F. After one year, the customer compared his electric bills and found a 29.4% reduction.

LONG TERM HEAT FLUX TESTS OF ROOFING SYSTEMS AT OAKRIDGE NATIONAL LABORATORIES, TENNESSEE

Summer-long tests closely monitored on actual roofs showed Thermo-Shield Roof Coatings reduced heat flux through the APP Bitumen Roofing System by 75 to 85% during daylight hours each week.

TESTS AT A CERTIFIED JAPANESE LABORATORY ON METAL STORAGE BUILDINGS: Thermo-Shield Exterior Coating outperformed 2" of fiberglass in the walls and 3" in the roof in keeping the interior cooler. The Thermo-Shield building also cooled quicker after the sun went down, reinforcing our belief that bulk insulation stores up heat during the day and keeps the building hotter well into the night.