GUARDIAN INSULATION

Reflects 97% of radiant energy

# SOLAR GUARD®

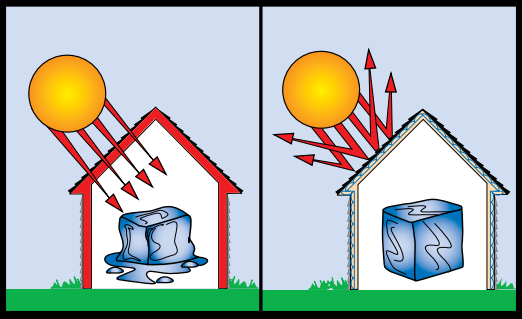
## REFLECTIVE INSULATION

**SolarGuard® Reflective Insulation greatly increases comfort in a host of residential and commercial applications. It's ideal alone or in conjunction with fiberglass batts for optimal thermal performance.**

**For total thermal protection on every job use SolarGuard Reflective Insulation alone or with fiberglass.**

- Behind fiberglass batts in walls
- Under roof trusses or roof deck
- Below radiant floors
- In crawl spaces
- On basement walls
- Behind recessed lights
- Overhead doors
- Outer sheds
- Metal buildings
- Post frame building

**Blocks all three modes of heat loss/gain!**



Total thermal protection. Radiant energy causes up to 93% of heat transfer. And only one insulation blocks radiant energy plus heat conduction and convection: SolarGuard Reflective Insulation.

**RESIDENTAL**
Increases home comfort in between conditioned and unconditioned spaces.

**COMMERCIAL**
May be used as a condensation blanket in well ventilated buildings.

**AGRICULTURAL**
Helps reduce heat gain.

**Available sizes –**
SolarGuard White/RFSK: 48" x 102' • 48" x 125' • 72" x 102' • 72" x 125'
SolarGuard Foil/Foil: 16" x 50' • 24" x 50' • 48" x 50'

**Thermal Properties:** When testing insulation materials in a device called a calibrated hot box, a sample of the material is mounted and different temperatures are maintained on the two sides of the sample. The difference in temperature is referred to as the Delta (Δ) T. A smaller Δ T will generally result in a higher R-value. The Δ T used in testing is a critical piece of information that should be reported along with the R-value and test method. Most reflective insulation manufacturers report their R-values based on test results achieved under the ASTM C236 test standard and often fail to report the Δ T. Often the exceptional R-values reported are based on only a 10 degree Fahrenheit Δ T. The ASTM C236 test standard has been discontinued and replaced by ASTM C1363/C976. When testing to this standard a Δ T of 30 degrees Fahrenheit or more is usually used. To properly evaluate the thermal performance of reflective insulation materials, only ASTM C1363/C976 test results, with a 30 degree Fahrenheit or greater Δ T should be considered.

**Fire Properties:** Many other reflective insulation products claim a Class 1 rating per ASTM E84, however they must support their product with poultry wire when testing in order to achieve these results. While the ASTM E84 test standard allows the use of such support, when burned in an unsupported condition that is more typical of their installation in a metal, post frame or other type of building, some bubble-pack or foam core reflective insulation products generate a Flame Spread many times the 25 rating required to achieve a Class 1 rating. All SolarGuard E84 test results reported herein were achieved without the use of additional support beneath the sample. Additionally, SolarGuard passes the UL1715/ UBC 26-3 Room Corner Wall Fire Test. SolarGuard White and Solarguard Foil meet all requirements for reflective insulation as required by the 2000 International Building Code (IBC).

**SOLARGUARD WHITE**

| Physical Properties | Test Method | Values |
|---|---|---|
| Flame Spread | ASTM E84 | 25 |
| Smoke Developed | ASTM E84 | 25 |
| Full Scale Corner Wall | UL 1715/UBC 26-3 | PASS |
| Thermal Performance* | ASTM C1363/C976 | Heat Flow Down R-10.3 |
| | | Heat Flow Up R-7.6 |
| | | Heat Flow Horizontal R-8.7 |

**SOLARGUARD RFSK and FOIL**

| Physical Properties | Test Method | Values |
|---|---|---|
| Flame Spread | ASTM E84 | 0 (RFSK) / 5 (FOIL) |
| Smoke Developed | ASTM E84 | 0 (RFSK) / 15 (FOIL) |
| Full Scale Corner Wall | UL 1715/UBC 26-3 | PASS |
| Thermal Performance* | ASTM C1363/C976 | Heat Flow Down R-11.6 |
| | | Heat Flow Up R-8.3 |
| | | Heat Flow Horizontal R-9.0 |

**SOLARGUARD FOIL MASONRY WALL THERMAL PERFORMANCE TESTS*****

| Furring Used | Test Method | Values |
|---|---|---|
| 1x2 Wood 16" o.c. | ASTM C1363/C976 | R-5.83 |
| 1x2 Wood 24" o.c. | ASTM C1363/C976 | R-6.14 |
| 2x2 Wood 16" o.c. | ASTM C1363/C976 | R-6.56 |
| Thermal Performance* | ASTM C1363/C976 | R-5.44 |

(*) System R-Values per ASTM C976/C1363, Air to Air with a 30 degree Fahrenheit temperature differential. These tests were conducted using a Calibrated Hot Box apparatus. The reflective insulation tested was .25" thick fiber glass insulation with foil facing on one side and a white scrim-reinforced facing on the other side. The test sample was installed in the middle of a 2 x 4 wood stud cavity, the wood framing was 16" o.c. with 3/4" thick plywood on each side. All R-Values are in hr-sq. ft.-degree F/BTU.
(**) System R-Values per ASTM C976/C1363, Air to Air with a 30 degree Fahrenheit temperature differential. These tests were conducted using a Calibrated Hot Box apparatus. The reflective insulation tested was .25" thick fiber glass insulation with foil facing on one side and a reinforced foil scrim facing on the other side. The test sample was installed in the middle of a 2 x 4 wood stud cavity, the wood framing was 16" o.c. with 3/4" thick plywood on each side. All R-Values are in hr-sq. ft.-degree F/BTU.
(***) System R-value per ASTM C1363/C976, Air to Air with a 50 degree Fahrenheit temperature differential. These tests were conducted using a calibrated hot box apparatus. All tests measure in the Horizontal Heat Flow direction. The reflective insulation tested was .25" thick fiberglass insulation with foil facing on both sides. The test sample was installed between a 3/4" plywood exterior sheathing (used to simulate a 4" thick cinder block wall) between the furring material defined in the table above. A 1/2" gypsum wall board was applied to the other side of the test sample.

**Evaluation of SolarGuard as an Air Barrier Material:** The air flow rate through SolarGuard, a foil-faced fiberglass blanket, has been measured in accordance with ASTM E 2178.✦ The air flow measurements were performed on product supplied by Guardian Building Products to the National Concrete Masonry Association. The air flow rate data that were obtained are shown in the following table. Each data point in the table is an average of the five observations for a specimen having an area of one square meter.

**TABLE 1. AIR FLOW DATA FOR SOLARGUARD**

| Pressure Difference (PA) | Air Flow (SLPM) |
|---|---|
| 25 | 1.322 |
| 50 | 1.816 |
| 75 | 2.228 |
| 100 | 2.442 |
| 150 | 3.044 |
| 300 | 4.530 |

The data in Table 1 can be described by the following equation with a R2 of 0.997.

$$\text{Air Flow} = 0.99809 + 0.01621\Delta P - 0.0000149\Delta P2 \quad (1)$$

The correlation shows a bias of 0.99809 SLPM, the Air Flow at ΔP=0. The air flow rate corrected for bias is shown as Equation (2)

$$\text{Air Flow Corrected} = 0.01621\Delta P - 0.0000149\Delta P2 \quad (2)$$

Air barrier material is defined by the ABAA◆ as having an air flow rate of no more than 0.02 L/s.m2 at ΔP = 75 Pa. Air flow rate calculated using Equation (2) is 1.132 SLPM at 75 Pa or 0.0189 L/s.m2 at 75 Pa for one square meter of area. SolarGuard satisfies the ABAA definition for an air barrier material.

✦National Concrete Masonry Association Job 07-318, May 21, 2007
◆Air Barrier Association of America

**Terminology:**
Pa = Pascal
ΔP = Change in Pressure
ΔT = Change in Time
o.c. = On Center

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