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REPORT NO.: 2133A

EXPIRES: See the current EVALUATION REPORT INDEX

CATEGORY: INSULATION

SUBMITTED BY:

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1. PRODUCT TRADE NAMES

Alfol Type 1A, Vapor Shield AA-2, VR Plus Shield, RBI Shield, Radiant Shield NT, Silver Shield Radiant Barrier, and FSK Shield

2. SCOPE OF EVALUATION

- 2.1 ASTM C 1224 for: Alfol Type 1A, Vapor Shield AA-2, VR Plus Shield, and RBI Shield.
2.2 ASTM C 1313 for: Radiant Shield NT, and Silver Shield Radiant Barrier
2.3 ASTM E 84 for: FSK Shield.

3. USES

Materials evaluated to ASTM C 1224 satisfy Section E104 for insulations, and are described in Section 4.2. Materials evaluated to ASTM C 1313 are sheet radiant barriers, and are described in Section 4.3. Materials evaluated to ASTM E84 are used as insulation facings or building paper, and are described in Section 4.4.

4. DESCRIPTION

4.1 General

4.1.1 Reflective Insulations - Overview - Through the use of surfaces of high reflectivity and low emissivity, these products reduce the heat transferred by radiation. The thermal resistance values include the effects of air within the space, thus are relatively dependent on the thickness of the space. Several construction tolerances can effect the thermal resistance value including; (1) consistency of the furring strip's thickness, (2) bowing of the cover plate, and (3) the spacing of the insulation sheets. Such deviations can enhance or retard the R-value of any type insulation. Certain insulation values are shown in Section 5.

4.1.2 Attic Floors - materials addressed in this report have not been evaluated according to ASTM E 970, thus shall not be installed exposed on top of the ceiling joists in attics (attic floors).

4.2 ASTM C 1224 Evaluations

4.2.1 Alfol Type 1A

1. General - Alfol Type 1A is a reflective insulation intended for use in vertical wall cavities formed by furring strips (usually 1" x 2" nominal) attached to the inside of masonry walls. Type 1A is formed by a minimum 0.00035" (1145 alloy) aluminum foil, a kraft forming sheet, and a 35 lb. kraft paper coated with 7 lbs of polyethylene. Internal expanders are oriented in such a way so as to form two non-conductive air spaces when installed. It is manufactured in 16" and 24" wide rolls containing 500 square feet each.

2. Evaluation according to ASTM C 1224 - passed. Specific testing is documented in Section 6.

3. Permeability - Water Vapor Transmission according to procedure A of ASTM E 96 dry cup method at 73.4 °F yielded a value of less than 1 perm.

4. Flame Spread & Smoke Developed Rating - ASTM E 84 yielded a flame spread index of less than 75 and a smoke developed rating of less than 450.

5. R-values for specific assemblies are shown below in Section 5. INSTALLATION.

4.2.2 Vapor Shield Type AA-2

1. General - Vapor Shield AA-2 is available in both non-perforated and perforated versions. AA-2 is a double layer reflective insulation intended for use in vertical wall cavities

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formed by furring strips (usually 1" x 2" nominal) attached to the inside of masonry walls. Type AA-2 is formed by a minimum of 0.00035" alloy 1145 foil and a 35 lb. kraft paper with internal expanders. Upon installation the layers open using internal expanders that form an approximate $\frac{3}{8}$ " thick air space between the layers. The material is then face stapled. The thickness of the second air space is dependent on the thickness of the furring strips. Type AA-2 is sold in rolls either 16" or 24" wide containing 500 square feet each.

2. Evaluation according to ASTM C 1224 - passed. Specific testing is documented in Section 6.

3. Permeability

1. Non-Perforated - Water Vapor Transmission according to procedure A of ASTM E 96 dry cup method at 73.4° F and 50% RH yielded an average value of less than 1 perm.

2. Perforated or High Perm Version - Water Vapor Transmission according to procedure A of ASTM E-96 dry cup method at 73.4° F and 50% RH yielded an average perm rating in excess of 5, and is therefore not a water vapor retarder.

4. Flame Spread & Smoke Developed Rating - Flammability by ASTM E 84 yielded a flame spread index of less than 75 and a smoke developed rating of less than 450.

5. R-values for specific assemblies are shown below in Section 5. INSTALLATION.

4.2.3 VR Plus Shield

1. General - VR Plus Shield is available in both non-perforated and perforated versions. VR Plus Shield is a three layer reflective insulation intended for use in vertical wall cavities formed by furring strips attached to the inside of masonry walls. VR Plus Shield is formed by an outer layer of 35lb kraft paper coated with polyethylene, a layer of 30 lb natural kraft paper laminated to a minimum 0.00025" aluminum foil, and a layer of minimum 0.00035" aluminum foil. Upon installation the layers open using internal expanders that form air spaces ranging from $\frac{1}{4}$ " to $\frac{1}{2}$ " thick. The thickness of the third air space is dependent on the thickness of the furring strips. VR Plus Shield is sold in rolls either 16" or 24" wide containing 500 square feet each.

2. Evaluation according to ASTM C 1224 - passed. Specific testing is documented in Section 6.

3. Permeability

1. Non-Perforated - Water Vapor Transmission according to procedure A of ASTM E 96 method A at 73° F and 50% RH yielded an average value of less than 1 perm.

2. Perforated or High Perm Version - Water Vapor Transmission according to procedure B of ASTM E-96 wet cup method at 73.4° F and 50% RH yielded an average perm rating in excess of 5, and is therefore not a water vapor retarder.

4. Flame Spread & Smoke Developed Rating - Flammability by ASTM E 84 yielded a flame spread index of less than 25 and a smoke developed rating of less than 450.

5. R-values for specific assemblies are shown below in Section 5. INSTALLATION.

4.2.4 RBI Shield

1. General - RBI Shield (Reflective Bubble Insulation) is intended for use in walls, floors or roofs. These products come in 125' long rolls in 16", 24", 48", 66" and 72" widths. It consists of two layers of air filled bubbles and various options for facings: foil on both sides or foil on one side and white or black polyethylene on the other. The total thickness of the insulation is $\frac{5}{16}$ ".

2. Evaluation according to ASTM C 1224 - passed. Specific testing is documented in Section 6.

3. Permeability - Water Vapor Transmission according to the "Desiccant Method" of ASTM E 96 at 122° F and 50% RH yielded an average value of less than 1 perm.

4. Flame Spread & Smoke Developed Rating - ASTM E 84 testing on RBI yielded a flame spread index of less than 25 and a smoke developed rating of less than 450.

5. R-values for specific assemblies are shown below in Section 5. INSTALLATION.

4.3 ASTM C 1313 Evaluations

4.3.1 Radiant Shield NT

1. General - Radiant Shield NT is available in both non-perforated and perforated versions. Radiant Shield is a sheet comprised of two layers of aluminum foil laminated to a layer of woven polyester with two layers of polyethylene. Radiant Shield NT is intended for use in walls, floors or roofs. These products come in 25.5", 48", and 51" wide rolls containing 500 square feet each.

2. Evaluation according to ASTM C 1313 - passed. Specific testing is documented in Section 6.

3. Permeability

1. Non Perforated - Water Vapor Transmission according to procedure A of ASTM E 96 yielded an average value of less than 1 perm.

2. Perforated or High Perm Version - Water Vapor Transmission according to the Desiccant Method of ASTM E-96 at 72° F and 45% RH yielded an average perm rating of 4.9. 4.9 exceeds the maximum value of 1 perm necessary to be an "approved vapor retarder" in Chapter 5 of the IECC.

4. Flame Spread & Smoke Developed Rating - Flammability by ASTM E 84 yielded a flame spread index of less than 25 and a smoke developed rating of less than 450.

4.3.2 Silver Shield Radiant Barrier

1. General - Silver Shield Radiant Barrier is available in both non-perforated and perforated versions. Silver Shield Radiant Barrier is a double layer radiant barrier intended for use in roofs. Silver Shield Radiant Barrier is formed by an inside layer of 1.4 mil metalized PVC. The outer layer is 0.000285" aluminum foil laminated with fire-retardant adhesive to 30 lb natural kraft paper reinforced with tri-directional fiberglass and polyester scrim. Upon installation the layers open using internal expanders that forms a minimum $\frac{3}{4}$ " thick air space between the layers. It is available in 16" or 24" wide rolls each containing 500 square feet. A 30" wide roll containing 250 square feet is also available.

2. **Evaluation** according to ASTM C 1313 - passed. Specific testing is documented in Section 6.

3. Permeability

1. **Non-perforated** - Water Vapor Transmission according to procedure A of ASTM E 96 dry cup method at 73.4° F and 50% RH yielded an average value of less than 1 perm.

2. **Perforated**- Water vapor transmission according to procedure B of ASTM E-96 wet cup method at 73.4° F and 50% RH yielded an average value in excess of 5.

4. **Flame Spread & Smoke Developed Rating** - ASTM E 84 yielded a flame spread index of less than 25 and a smoke developed rating of less than 50.

4.4 ASTM E - 84

4.4.1 FSK Shield

1. **General** - FSK Shield is intended for use in ceilings, roofs, walls and floors as a flame retardant facing over unfaced insulation. FSK Shield is a single sheet product consisting of 0.0003 inch thick aluminum foil, fiberglass scrim, and 30 lb. kraft paper. FSK Radiant Barrier is sold in 54" wide rolls of 1000 ft² each.

2. Flame Spread & Smoke Developed Ratings-

1. FSK Shield Alone: UL 723 the FSK Shield exhibited a flame spread less than 25 and a smoke developed rating of less than 450.

2. FSK Shield (on foil side) and R-11 un-faced fiberglass batt, when tested according to ASTM E 84 yielded a flame spread index of less than 25 and a smoke developed rating of less than 50.

3. FSK Shield (on foil side) and R-19 un-faced fiberglass batt, when tested according to ASTM E 84 yielded a flame spread index of less than 25 and a smoke developed rating of less than 50.

4. FSK Shield (on foil side) and R-30 un-faced fiberglass batt, when tested according to ASTM E 84 yielded a flame spread index of less than 25 and a smoke developed rating of less than 50.

5. INSTALLATION

5.1 General - Installation Instructions

The manufacturer's published installation instructions shall be strictly adhered to, and if requested by the building official, a copy of this report and the installation instructions shall be available at all times on the job site during installation. The instructions within this report govern if there are any conflicts between the manufacturer's instructions and this report. Applicable care must be exercised to properly expand the material. All tears must be repaired. Insulations covered in this report shall not be installed exposed on the attic floor.

5.2 Alfol Type 1A

R value @³/₄" - When tested according to ASTM C 236 (horizontal heat flow-wall application) with a nominal 1" x 2" (actual ³/₄" thick) furring strips 16" o.c., the Alfol Type 1A exhibited an R-value of 4.28 hr ft² °F/Btu, (insulation & cavity).

5.3 Type AA-2 Thermal Resistance

5.3.1 R value @³/₄" - When tested according to ASTM C 236 (horizontal heat flow-wall application) with a nominal 1" x 2" (actual ³/₄" thick) furring strips 16" o.c. with a differential air to air temperature of 29.24° F and a mean temperature of 75.7° F, the Non Perforated type AA-2 exhibited an R-value of 4.2 hr ft² °F/Btu, (insulation & cavity). R - value for the Perforated AA-2 is calculated to be 4.1 hr ft² °F/Btu.

5.3.2 R value @⁷/₈" - When tested according to ASTM C 236 (horizontal heat flow-wall application) with a ⁷/₈" x 1.5" (actual) furring strips 16" o.c. with a differential air to air temperature of 31.2° F and a mean temperature of 74.7° F, the Non Perforated type AA-2 exhibited an R-value of 4.7 hr ft² °F/Btu, (insulation & cavity). R - value for the Perforated AA-2 is calculated to be 4.6 hr ft² °F/Btu.

5.3.3 R value @ 1.5" - When tested according to ASTM C 236 (horizontal heat flow-wall application) with a 1.5" x 1.5" (actual) furring strips 16" o.c. with a differential air to air temperature of 24.7°F and a mean temperature of 71° F, the Non Perforated type AA-2 exhibited an R-value of 5.2 hr ft² °F/Btu, (insulation & cavity). R - value for the Perforated AA-2 is calculated to be 5.1 hr ft² °F/Btu.

5.4 VR Plus Shield

5.4.1 R value @ 1" - When tested according to ASTM C 236 (horizontal heat flow-wall application) with an actual 1" cavity formed by furring strips 16" o.c. with a differential air to air temperature of 28.3° F and a mean temperature of 71° F, the VR Plus Shield exhibited an R-value of 5.2 hr ft² °F/Btu, (insulation & cavity). R - value for the Perforated VR Plus Shield is calculated to be 5.1 hr ft² °F/Btu.

5.4.2 R value @ 1.5" - When tested according to ASTM C 236 (horizontal heat flow-wall application) with two furring strips of 1" and ¹/₂" thick placed 16" o.c. with a differential air to air temperature of 30.6° F and a mean temperature of 73.8° F, the type VR Plus Shield exhibited an R-value of 7.1 hr ft² °F/Btu, (insulation & cavity). R - value for the Perforated VR Plus Shield is calculated to be 7 hr ft² °F/Btu.

5.5 RBI

5.5.1 R value @ 1" - When tested according to ASTM C 236 (Vertical heat flow down summer application) the set up consisted of 1" x 1⁷/₁₆" studs placed 16" oc forming a 1" air space above the RBI & and the bottom open to below. The RBI foil side faced the 1" air space and the white plastic faced down. With a differential air to air temperature of 30.7° F and a mean temperature of 74.5° F, the type RBI exhibited an R-value of 6.36 hr ft² °F/Btu, (1" air within the cavity & insulation & bottom surface air resistance). The Calculated R-value for RBI having two foil sides, heat flow down (summer conditions) is 9.78 hr ft² °F/Btu which includes 1" of air within the cavity & insulation & bottom surface air resistance).

5.5.2 R value @ 8" according to ASTM C 1224 - In this instance the 8" cavity was tested according to ASTM C 236 & derived according to ASTM C 1224 (Vertical heat flow down summer application). The set up consisted of an 8" horizontal air space above the RBI & and the bottom open to below. The RBI foil side faced the 8" air space and the white plastic faced down. With a differential air to air temperature of 30.5° F and a mean temperature of 72.7° F, the type RBI exhibited an R-value of 7.63

hr ft² °F/Btu, (consisting of the 8" air space within the cavity & insulation & bottom surface air resistance). The Calculated R-value for RBI having two foil sides, heat flow down (summer conditions) is 11.16 hr ft² °F/Btu which includes 8" of air within the cavity & insulation & bottom surface air resistance).

Note: According to the testing laboratory, the small cavity aspect ratio of 30.5"/8" requires that additional radiant transfer items be considered that are neglected in the strict ASTM C 1224 procedure. Specifically there is also radiation heat exchange between the hot plywood cover surfaces and the long intermediate temperature stud surfaces, as well as the hot plywood cover surfaces and the short, intermediate temperature end frame sections. When these are considered the air space above, RBI, and below exhibited a R value of 13.7 for the white undercoating and 17.4 for the reflective undercoating.

5.5.3 Calculated R- values for RBI

Table 5.5.3 Calculated R-Values for RBI^{1,2} (units of R = hr ft² °F/Btu) Foil Emissivity = 0.03			
Air space thickness above RBI insulation	White & Foil³	Black & Foil³	Foil & Foil
1" Air space above with R = 4.92	7	7	10
2.5" Air space above R = 8.01	10	10	13
3.5" Air space above R = 9.84	11	11	15
6" to 8" Air space above R is approximately 11.5 ⁴	13 ⁴ Approximate	13 ⁴ Approximate	17 ⁴ Approximate

1. R- values shown include resistance of upper air space, RBI, and lower or room air resistance.
2. In these calculations, the RBI material itself has an R-value of 0.70.
3. Where white/foil RBI material is used, the foil side faces up into the cavity.
4. Calculated values are approximate for this depth of air space.

Table 5.5.3 shows calculated R-values for RBI below a metal roof with various thickness of air spaces in heat flow down (summer conditions). Thickness shown is distance from upper surface of insulation to inside of metal roof deck, and the R-value shown in column 1 is achieved by this air space alone. The insulation is suspended above an open room. The open air space below the insulation has an R-value of 0.92 for the white/foil RBI and 4.55 for the Foil/Foil RBI.

6. SUBSTANTIATING DATA

6.1 Manufacturer's descriptive literature and installation instructions.

6.2 Alfol Type IA test reports

- 6.2.1 ASTM C 1371 test for foil emittance report by R & D Services, signed by David W. Yarbrough, PhD, E, dated August 25, 1997.
- 6.2.2 ASTM E 96 Procedure A Dry Cup Water Vapor Permeability test by Geoscience Limited, signed by H.F. Poppendiek, dated December 4, 1995.
- 6.2.3 ASTM E 84 Flammability test by SGS U. S. Testing, signed by Steve Caldarola and Frank Pepe, dated March 10, 1997.
- 6.2.4 ASTM D 3310 Corrosivity test by Geoscience Ltd., signed by T. T. Saka and H. F. Poppendiek, dated November 1995.
- 6.2.5 ASTM C 1224 Section 9.2.1 Adhesive Performance (Bleeding and Delamination) test by Geoscience Ltd., signed by H. F. Poppendiek, dated May 19, 1997.
- 6.2.6 ASTM C 1224 Section 9.2.2 Adhesive Performance (pliability) test by Geoscience Ltd., signed by H. F. Poppendiek, dated May 19, 1997.
- 6.2.7 MIL - STD-81QD Method 508.2 Fungus Resistance Test by Truesdail Laboratories, Inc., signed by Karl W. Schiller, MS, dated April 24, 1997.
- 6.2.8 ASTM C 177 test on mass insulation by Geoscience Ltd, Report #GLM 637, signed by H. F. Poppendiek, dated May 9, 1997.
- 6.2.9 ASTM C 236 test in a 3/4" air space evaluated according to ASTM C 1224 by Geoscience Ltd., Report #GLM 621, signed by H.F. Poppendiek, dated March 4, 1997.
- 6.2.10 Evaluation of various tests to ASTM C 1224 by Robert O. Covington, P.E., dated August 26, 1997.

6.3 Vapor Shield Type AA-2

- 6.3.1 Foil Emittance Test to ASTM C 1371 by R & D Services, Inc, dated August 25, 1997, signed by D. W. Yarbrough, Phd, P.E..
 1. AA-2 [non-perforated] ASTM E 96 for Permeability by Geoscience Ltd., dated December 4, 1995, signed by H. F. Poppendiek.
 2. AS-2 [perforated] ASTM E 96 for permeability by Geoscience Ltd., dated October 1, 2001, signed by H. F. Poppendiek.
- 6.3.2 AA-2 ASTM E 84 for Flammability by SGS U. S. Testing Company Inc, dated May 9, 1997, Report #121518, signed by S. Caldarola and F. Peep
- 6.3.3 AA-2 & B-3 ASTM D 3310 for Corrosiveness by Geoscience Ltd., dated November 1995, GLTN - 76, signed by T. T. Saka and H. F. Poppendiek.
- 6.3.4 AA-2 Pliability, bleeding and delaminating tests by Geoscience Ltd., dated May 19, 1997, signed by H. F. Poppendiek.
- 6.3.5 AA-2 & B-3 ASTM C 1338 Fungi Resistance by SGS U. S. Testing Company Inc., dated August 4, 1998, Report #111623, signed by D. K. Goins, PhD. and J. Laciirignola.
- 6.3.6 Frame Verification tests using foam by Geoscience Ltd., signed by H. F. Poppendiek.
 1. 3/4" dated May 9, 1997, by ASTM C 177
 2. 7/8" dated September 29, 1998, by ASTM C 236
 3. 1.5" dated August 7, 1997, by ASTM C 236
- 6.3.7 AA-2 ASTM C 236 R-Value by Geoscience Ltd., signed by T. T. Saka and H. F. Poppendiek.
 1. 3/4" dated April 2000 GLM -669
 2. 7/8" dated September 1998 GLM-653
 3. 1.5" dated September 1997 GLM-645

- 6.3.8 Letter from Geoscience, dated January 19, 2000, regarding GLM-645, signed by H. Poppendiek.
- 6.3.9 Evaluation of Perforated vs non-perforated AA-2 by Geoscience, LTD., dated October 30, 2001, signed and sealed by Dr. H. F. Poppendiek, P.E.
- 6.3.10 Letter from Geoscience Ltd., dated November 12, 2001, sealed by Dr. H. F. Poppendiek, P.E.
- 6.4 VR Plus Shield**
- 6.4.1 VR Plus Shield ASTM C 1371 for Emittance by R & D Services, dated November 14, 2000, Specimen: 1023001004-1 signed by R. S. Graves.
1. VR Plus Shield [Non-perforated] ASTM E 96 for Permeability by SGS U. S. Testing Report #146967, dated 25 Oct 2000, signed by H. Litondo and C.R. Roberti.
 2. VR Plus Shield [perforated] ASTM E 96 for Permeability by Geoscience Ltd., dated June 21, 2002, signed by H. F. Poppendiek.
- 6.4.2 VR Plus Shield ASTM E 84 Flammability test by SGS U. S. Testing Company Inc., Report #146967.001, dated October 13, 2000, signed by D. Lepore.
- 6.4.3 VR Plus Shield ASTM D 3310 Corrosiveness by R & D Services, Specimen 1023001004-1, dated November 21, 2000, signed by R. Graves.
- 6.4.4 VR Plus Shield ASTM C 1313 Adhesive Performance (Bleeding And Delamination) Section 10.1 by R & D Services Specimen 1023000912-1, dated October 2, 2000, signed by R. Graves.
- 6.4.5 VR Plus Shield ASTM C 1338 Fungi Resistance tests by R & D Services, dated Dec 1, 2000, signed by D. W. Yarbrough, PhD, P.E.
- 6.4.6 VR Plus Shield ASTM C 236 for R-Value by Geoscience Ltd, signed by F. Poppendiek
1. 1" Cavity GLM 661-C, dated September 2000.
 2. 1.5" Cavity GLM 646-B, dated November 2000.
- 6.4.7 Evaluation of Perforated vs non-perforated VR Plus by Geoscience, LTD, dated July 15, 2002, signed and sealed by Dr. H. F. Poppendiek, P.E.
- 6.4.8 Letter from Geoscience Ltd dated July 11, 2002, signed by H. F. Poppendiek
- 6.5 RBI Shield**
- 6.5.1 RBI ASTM C 1371 for Emittance by Celotex, dated June 24, 1998, MTS Job #258528, signed by R. W. Woltemar and S. D. Gatland II.
- 6.5.2 RBI ASTM E 96 for Permeability by R & D Services, Report #RD 99240, dated December 28, 1999, signed by R. S. Graves and D. W. Yarbrough PhD, P.E..
- 6.5.3 RBI ASTM E 84 Flammability test
1. By Omega Point Laboratories dated August 28, 2001 report #15320-109423 signed by W. Fitch, P.E.
 2. By Omega Point (foil both sides) report No 15320-98764 dated August 1, 1995 signed by William E. Fitch, P.E.
- 6.5.4 RBI Pliability, Corrosiveness & Delamination tests by SGS U. S. Testing Company Inc., Report #112119-3, dated September 23, 1998, signed by F. Savino and G. Falla.
- 6.5.5 RBI ASTM C 1338 Fungi Resistance by SGS U. S. Testing Company Inc., Report #112119- 002R1, dated September 15, 1998, signed by J. Lacirignola and D. K. Goins, PhD.
- 6.5.6 Letter from John Starr of Covertech, dated November 3, 1999.
- 6.5.7 RBI ASTM C 236 @1" for R-Value by Geoscience Ltd, signed by F. Poppendiek, GLM 667, dated March 2000.
- 6.5.8 Calculated R-values for RBI by Dr. H. F. Poppendiek conveyed by letter, dated March 13, 2000.
- 6.5.9 RBI ASTM C 236 @8" for R-Value by Geoscience Ltd., signed by H. F. Poppendiek, GLM 670, dated May 2000.
- 6.5.10 Calculated R-Values for RBI by Geoscience Ltd, signed by H. F. Poppendiek, dated March 13, 2000
- 6.6 Radiant Shield NT - ASTM C 1313**
- 6.6.1 Radiant Shield NT ASTM C 1371 for Emittance by R & D Services, dated August 9, 2000, Indent: 1177000804-1, signed by R. S. Graves.
- 6.6.2 Non-perforated Permeability ASTM E 96, Tear Strength ASTM D2661, Bleeding and Pliability ASTM C 1313 by SGS U. S. Testing, Report # 141978, dated July 20, 2000, signed by J. H. Van Houten, Sr. and F. Savino.
- 6.6.3 Radiant Shield NT ASTM E 84 Flammability test by Omega Point., Report #15757, dated September 19, 1997, signed by W. .E. Fitch P.E..
- 6.6.4 Perforated Permeability ASTM E96, by R & D Services, Inc, Report # RD03146 dated March 19, 2003, signed by D. W. Yarbrough, Phd, P.E..
- 6.7 Silver Shield Radiant Barrier (formally known as Silver Shield Type B-3)**
- 6.7.1 ASTM C 1371 for Emittance by R & D Services, dated October 3, 2000, Specimen 1023000912-1, signed by R. S. Graves, December 14, 2000.
1. B-3 [non-perforated] ASTM E 96 for Permeability by Geoscience Ltd., dated December 4, 1995, signed by H. F. Poppendiek.
 2. B-3 [perforated] ASTM E 96 for Permeability by Geoscience Ltd., dated May 31, 2002, and letter explaining results, dated June 7, 2002, both signed by H. F. Poppendiek.
- 6.7.2 Silver Shield Radiant Barrier ASTM E 84 for Flammability by SGS U. S. Testing Company Inc., dated August 10, 2000, Report #143593-R1, signed by M. Ostrovsky and J. Van Houten
- 6.7.3 Corrosivity Tests ASTM D 3310 by Geoscience Ltd., dated November 1995, GLTN - 76, signed by T. T. Saka and H. F. Poppendiek.
- 6.7.4 Bleeding & Delamination ASTM C 1313 by R & D Services, dated October 2, 2000, signed by R. S. Graves, December 14, 2000.
- 6.7.5 Tong Tear ASTM D 2661 by U. S. Testing, dated 27 October 1999, signed by C. Kehaya and C. R. Robertic CPP
- 6.7.6 Fungal Resistance Testing ASTM C 1338 by U. S. Testing, dated August 14, 1998, signed by D. Keither Goins, Ph.D.
- 6.8 FSK Shield**
- 6.8.1 FSK UL 723 for Flammability by Underwriters Laboratory Inc., File R8734, Project 78NK12547, dated June 12, 1979, signed by K. Rhodes and J. F. Smith.
- 6.8.2 ASTM E 84 test on FSK Facing and R-11 unfaced fiberglass insulation by SGS U. S. Testing Report #120461-R1, dated March 27, 2001, signed by D. Lepore.
- 6.8.3 ASTM E 84 test on FSK Facing and R-19 unfaced fiberglass insulation by SGS U. S. Testing Report #153379-1, dated March 26, 2001, signed by D. Lepore.
- 6.8.4 ASTM E 84 test on FSK Facing and R-30 unfaced fiberglass insulation by SGS U. S. Testing Report #153379-2, dated March 26, 2001, signed by D. Lepore.

7. CODE REFERENCES

Florida Building Code - 2001 Edition

Section 103.7 Alternate Materials and Methods
Section 708 Thermal Insulating Materials

Standard Building Code - 1999 Edition

Section 103.7 Alternate Materials and Methods
Section 708 Thermal Insulating Materials
Section 803.2 Classification
Appendix E Energy Conservation

Standard Building Code - 1997 Edition

Section 103.7 Alternate Materials and Methods
Section 708 Thermal Insulating Materials
Section 803.2 Classification
Appendix E Energy Conservation

International One- and Two- Family Dwelling Code -
1998 Edition

Section R-108 Alternate Materials and Systems
Section 319 Insulation
Appendix C Energy Conservation

8. COMMITTEE FINDINGS

The Subcommittee on Evaluation in review of the data submitted finds that, in their opinion, the Alfol Type 1A, Vapor Shield AA-2, VR Plus Shield, RBI Shield, Silver Shield Radiant Barrier, Radiant Shield NT, and FSK Shield as described in this report conform with or are suitable alternates to those specified in the *Standard Building Code*, the *Florida Building Code*, and the *International One and Two Family Dwelling Code* or Supplements thereto.

9. LIMITATIONS

- 9.1 Insulations noted in Section 1 shall be installed in strict accordance with the manufacturer's installation instructions and this report.
- 9.2 When requested by the building official, this report shall be provided at the time of permit application.
- 9.3 None of these insulations may be installed exposed on the upper surface of the ceiling joists in the attic.
- 9.4 Only Alfol Type 1A, Vapor Shield AA-2, VR Plus Shield, and RBI were evaluated as reflective insulations to ASTM 1224.

10. IDENTIFICATION

Each package or roll of Fi-Foil insulation produced under this report shall be marked with the name and/or trademark of the manufacturer, the SBCCI Public Safety Testing and Evaluation Services, Inc. Seal, and the number of this report for field identification.

11. PERIOD OF ISSUANCE

SEE THE CURRENT EVALUATION REPORT INDEX FOR STATUS OF THIS LEGACY EVALUATION REPORT.

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