

APPROVAL REPORT

HYDRO-STOP PREMIUMCOAT SYSTEM FOR USE IN CLASS 1 ROOF CONSTRUCTIONS

Prepared For:

HYDRO-STOP
1465 PIPEFITTER STREET
NORTH CHARLESTON, SC 29405

3000150

Class 4470

Revised: September 22, 1999

Supercedes Report Dated: September 1, 1999

FACTORY MUTUAL



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J.I. 3000150
(4470)

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FROM

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I INTRODUCTION

1.1 Hydro-Stop, Inc. submitted their PremiumCoat Roofing and Waterproofing System for testing to determine if it would meet the Approval requirements of Factory Mutual Research Corporation (FMRC) Standard 4470 for Class 1 Fire, Windstorm and Hail Classifications for use in Class 1 roof construction.

1.2 Examination included ASTM E108 (96) fire testing for potential exterior fire spread, simulated wind uplift testing, simulated hail damage testing, water leakage testing and resistance to foot traffic testing. Testing over lightweight insulating concrete was completed under J.I. 1D7A4.AM.

1.3 Test results show that the PremiumCoat Roofing and Waterproofing System submitted for testing meets the FMRC Standard 4470 Approval requirements for Class 1 Roof Covers when installed as described in the CONCLUSIONS of this report.

II MATERIALS TESTED

2.1 Premiumcoat FoundationCoat and SaturationCoat is a green water based acrylic emulsion coating applied as foundation and saturation layer of the PremiumCoat System. It is brush applied at nominal rate of 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric and a SaturationCoat brush applied at nominal rate of 1.25 gal/sq (0.51 ℓ/m^2).

2.2 PremiumCoat White Finish Coat is a water based acrylic copolymer resin coating. It is brush, roller or spray applied to the SaturationCoat in two coats at a combined nominal rate of 1.5 gal/sq (0.61 ℓ/m^2).

2.3 BarrierGuard is an acrylic modified waterproofing slurry consisting of bonding agents, resins and water reducing agents. It is blended with water and portland cement to form BarrierGuard Slurry which is brush applied at a rate of 0.5 gal/sq (0.2 ℓ/m^2).

2.4 StableRust Primer is a water based primer for use on existing metal panel roofs. It is brush applied at a rate of 0.5 gal/sq (0.2 ℓ/m^2).

2.5 PremiumCoat Fabric is a stitchbonded polyester fabric. It consists of 150 denier yarn and 100% polyester fiber. It weighs approximately 3 oz/yd² (0.5 kg/m²).

2.6 The proprietary formulations for all products are on file at FMRC.

III TESTS: CRITERIA AND PROCEDURES

3.1 Tests conducted were as required by the FMRC Standard 4470 for Class 1 Roof Covers.

3.2 FMRC Simulated Windstorm Classification Pressure Test - The simulated wind uplift pressure test was conducted to evaluate the ability of the above deck components to resist a minimum simulated wind uplift pressure of 60 psf (2.9 kpa) without failure of the assembly.

3.2.1 The uplift pressure test utilizes a 9 ft x 5 ft x 2 in. (2.7 m x 1.5 m x 51 mm) steel pressure vessel arranged to apply air pressure at pre-established standard rates to the underside of the test panel which forms the top of the pressure vessel.

3.2.2 The simulated wind uplift pressure was applied to the underside of the samples using compressed air. A net pressure of 30 psf (1.4 kpa) was applied to each test sample and maintained for 1 minute. The pressure was increased to 45 psf (2.2 kpa), then 60 psf (2.9 kpa), and held for 1 minute at each increment. This schedule was increased in increments of 15 psf (0.7 kpa) every minute until failure occurred.

3.3 FMRC Simulated Windstorm Classification Pull Tests - The simulated wind uplift pull tests were conducted to evaluate the ability of the above deck components to resist a simulated wind uplift force of 60 psf (2.9 kpa) and 90 psf (4.3 kpa) without failure of the assembly.

3.3.1 The uplift pull test utilizes a 4 ft x 4 ft x 6 in. (1.2 m x 1.2 m x 152 mm) block of concrete with a 2 ft x 2 ft (0.6 m x 0.6 m) roof sample constructed in accordance with the manufacturers specifications. A 2 ft x 2 ft x 1.5 in. (0.6 m x 0.6 m x 38 mm) plywood square containing a centrally located eye-bolt is secured to the top surface of the roof sample.

3.3.2 One end of a force sensing device was then connected to the eye-bolt and the other end connected to a chain hoist assembly. A net pressure of 20 psf (1.0 kpa) to the test sample and maintained for 1 minute. The pressure was increased to 30 psf (1.4 kpa), then 40 psf (1.9 kpa), and held for 1 minute at each increment. This schedule was increased in increments of 10 psf (0.5 kpa) every minute until failure occurred.

3.4 ASTM E108 (96) Spread of Flame Fire Testing - The exterior fire testing was conducted in accordance with ASTM E108 (96) Fire Tests of Roof Coverings for Class A non-combustible deck test procedures. The wind velocity over the top of each sample was adjusted to 12±0.5 mph (5.4±0.2 m/s). The machine was calibrated with a "Blank" panel set at a slope of 5:12. The flame temperature was then adjusted to 1400°±50°F (760°±28°C) for the Class A tests. The temperature was determined by a thermocouple located 1 in. (25 mm) above the surface and ½ in. (13 mm) toward the source of the flame from the lower edge of the "Blank" panel. Samples were tested with the flame and air current applied continuously for a period of 10 minutes. During and after application of the flame, the samples were observed for distance of maximum flame spread, glowing brands and other damage.

3.5 FMRC Simulated Hail Damage Testing - The simulated hail damage testing was conducted using the FMRC simulated hail damage test apparatus to evaluate the ability of the roof cover/insulation combinations to withstand a hailstorm without damage to the covering. The test criteria state that there must be no signs of cracking, splitting, internal separation, delamination or rupture of the roof cover.

3.5.1 Severe Hail Damage Test for Class 1-SH - A 1-3/4 in. (49 mm) diameter steel ball weighing 0.78 lbs. (0.3 kg) was dropped from a 17 ft 9-1/2 in. (5.4 m) height through a 2 in. (51 mm) ID PVC tube. This procedure was repeated several times on various sections of the sample. After each drop the sample was inspected for cracks in the weatherproof membrane. Following the initial testing, the sample was conditioned (weathered) for 1000 hours in the FMRC Ultraviolet Weatherometer. The hail test procedure was then repeated on the conditioned sample.

3.5.1 Moderate Hail Damage Test for Class 1-MH - A 2 in. (51 mm) diameter steel ball weighing 1.625 lbs. (737 g) was dropped from a 5 ft (1.5 m) height through a 2.25 in. (57 mm) ID steel tube supported by a tripod assembly. This procedure was repeated ten times on various sections of the sample. After each drop the sample was inspected for cracking, splitting, internal separation, delamination and rupture of the roof cover.

3.6 FMRC Resistance to Foot Traffic Testing - Testing was conducted using the FMRC resistance to foot traffic test apparatus to determine the ability of the roof cover/insulation combinations to resist foot traffic.

3.6.1 The test apparatus consists of a 3 in. (76 mm) square steel plate placed on the coated insulation. A 200 lb. (91 kg) load was imposed on the plate. The load was then reduced to zero and reloaded a minimum of four additional times. Penetration and residual readings were taken each time without removing the plate.

3.6.2 The specimen was inspected after the test and the condition of the cover at the steel plate interface noted. Tearing or cracking of the protective coating causing exposure of the foam or other compressible core materials is unacceptable.

3.7 FMRC Susceptibility to Leakage Testing - Testing was conducted in accordance with the FMRC Susceptibility to Leakage Test procedure.

3.7.1 The test apparatus consists of top and bottom sections which are bolted together with the specimen being evaluated placed as a diaphragm between the sections. The top and bottom sections consist of 9-1/4 in. (203 mm) diameter pipe. An 11-5/8 in. (295 mm) diameter pipe flange is cemented to the other end of each pipe section. Both top and bottom sections are bolted together at the flanges with the cover being evaluated placed between them. The apparatus is fabricated to allow both a standing head of water above and additional air pressure below the test sample. Each section is fabricated with two 1/2 in. (13 mm) diameter pipe outlets to allow connection of an air pressure inlet and pressure gauge.

3.7.2 The sample was conditioned (weathered) for 1000 hours in the FMRC Ultraviolet Weatherometer. After weathering, a 10 in. (254 mm) diameter specimen is bolted in place between the flanges of the test apparatus. Water is placed over the sample to a depth of 6 in. (152 mm) and maintained for a period of 7 days. At the end of the 7 day period, air is introduced below the water to a 1 psig (6.3 kPa) level and cycled 25 times from 1 psig (6.3 kPa) to ambient. Test criteria state that there shall be no signs of water leakage during the 7 day period. In addition, there shall be no signs of water leakage during or after the pressure cycles.

IV TEST SAMPLES

4.1 FMRC Simulated Windstorm Classification Pressure Test - One 5 x 9 ft wind uplift pressure test was completed over 22 ga. [0.0295 in. (0.75 mm) thick] steel deck with the following above deck sample construction and results:

1. 1.3 in. (33 mm) thick Apache Pyrox insulation secured to the deck using 8 Olympic #12 screws and Standard Steel plates per 4 x 4 ft (1.2 x 1.2 m) board.
2. FoundationCoat applied at 1.25 gal/sq (0.51 ℓ/m^2) at the insulation joints and 6 in. (152 mm) wide PremiumCoat Fabric was used to cover the joints followed by additional FoundationCoat applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) over the entire sample followed by PremiumCoat Fabric laid into the foundation coat providing for 4 in. (102 mm) wide laps. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
4. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: Sample failed after 5 seconds at the 135 psf (6.4 kPa) pressure level as a result of a combination of membrane tearing around a plate after it delaminated from the plate and insulation rupture over a stress plate. Meets Class 1-90.

4.2 FMRC Simulated Windstorm Classification Pull Tests - Six 2 x 2 ft wind uplift pull tests were completed over structural concrete. Sample No.'s 1 through 4 had a coating of asphalt over the structural concrete to represent an existing roof and Sample No.'s 5 and 6 used new structural concrete. The above deck sample constructions and results follow.

Sample No. 1:

1. Atlas AC Foam-II insulation was adhered to the deck with 2 rows of $\frac{3}{4}$ to 1 in. (19 to 25mm) wide beads of Insta-Stick Roofing Adhesive spaced 12 in. (305 mm) on center.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: Sample failed after 7 seconds at the 150 psf (7.1 kPa) pressure level as a result of Insta-Stick delamination from the asphalt. Meets Class 1-150.

Sample No. 2:

1. Apache Pyrox insulation was adhered to the deck with 2 rows of $\frac{3}{4}$ to 1 in. (19 to 25mm) wide beads of Insta-Stick Roofing Adhesive spaced 12 in. (305 mm) on center.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: Sample failed after 12 seconds at the 210 psf (10.0 kPa) pressure level as a result of Insta-Stick delamination from the asphalt. Meets Class 1-225.

Sample No 3:

1. Johns Manville E"NRG"Y-2 insulation was adhered to the deck with 2 rows of $\frac{3}{4}$ to 1 in. (19 to 25mm) wide beads of Insta-Stick Roofing Adhesive spaced 12 in. (305 mm) on center.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: Sample failed slowly during the 105 psf (4.9 kPa) pressure level as a result of Insta-Stick delamination from the asphalt. Meets Class 1-105.

Sample No. 4:

1. 1.5 in. thick EPS insulation was adhered to the deck with 2 rows of ¾ to 1 inch (19 to 25mm) beads of Insta-Stick Roofing Adhesive spaced 12 in. (305 mm) on center.
2. 0.25 in. thick Dens Deck was adhered to the deck with 2 rows of ¾ to 1 in. (19 to 25mm) wide beads of Insta-Stick Roofing adhesive spaced 12 in. (305 mm) on center.
3. FoundationCoat was applied at 1.25 gal/sq (0.51 l/m²) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 l/m²).
4. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 l/m²).
Results: Sample failed during the incremental pressure increase from 240 to 255 psf (11.5 to 12.2 kPa) pressure level as a result of Insta-Stick delamination from the asphalt. Meets Class 1-270.

Sample No. 5:

1. New structural concrete.
2. Concrecel lightweight insulating concrete.
3. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 l/m²).
4. FoundationCoat was applied at 1.25 gal/sq (0.51 l/m²) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 l/m²).
5. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 l/m²).

Results: Sample failed after 4 seconds at the 330 psf (15.8 kPa) pressure level as a result of Concrecel concrete delaminating from itself and the structural concrete. Meets Class 1-375.

Sample No. 6:

1. New structural concrete.
2. Concrecel lightweight insulating concrete.
3. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 l/m²).
4. FoundationCoat was applied at 1.25 gal/sq (0.51 l/m²) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 l/m²).
5. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 l/m²).

Results: Sample failed after 30 seconds at the 555 psf (26.2 kPa) pressure level as a result of Concrecel concrete delaminating from itself and the structural concrete. Meets Class 1-735.

4.3 ASTM E108 (93) Spread of Flame Fire Test Panels - 3.33 x 8 ft (1.0 x 2.4 m) Spread of Flame tests were completed using 0.5 in. (13 mm) thick plywood decks and the following above deck sample constructions:

Samples No. 1 & 2:

1. Metal panel roof.
2. StableRust Primer was applied at 0.5 gal/sq (0.2 l/m²).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 l/m²).

Samples No. 3 & 4:

1. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 l/m²).
2. FoundationCoat was applied at 1.25 gal/sq (0.51 l/m²) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 l/m²).
3. FinishCoat was applied in two coats at a combined rate of 1.5 gal/sq (0.61 l/m²).

Samples No. 5 & 6:

1. 3 ply organic felt BUR.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 ℓ/m^2).
4. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Samples No. 7 & 8:

1. 3 ply organic felt BUR.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Sample No. 9:

1. 1.3 in. (33 mm) thick Apache Pyrox insulation.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Samples No. 10 & 11:

1. 1.4 in. (36 mm) thick Johns Manville E"NRG"Y-2 insulation.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Sample No. 12:

1. 1.3 in. (33 mm) thick Atlas AC Foam-II insulation.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Sample No. 13:

1. 1.3 in. (38 mm) thick Atlas AC Foam-II insulation.
2. 3 ply asphaltic BUR.
3. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
4. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 ℓ/m^2).
5. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Sample No. 14:

1. 1.4 in. (36 mm) thick Johns Manville E"NRG"Y-2 insulation.
2. 3 ply asphaltic BUR.
3. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
4. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 ℓ/m^2).
5. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

<u>Sample No.</u>	<u>Slope</u>	<u>Flame</u>		<u>Rating</u>
		<u>in. Spread (mm)</u>		
1	1 in 12	30	(762)	A
2	1 in 12	43	(1092)	A
3	1 in 12	30	(762)	A
4	1 in 12	28	(711)	A

<u>Sample No.</u>	<u>Slope</u>	<u>Flame</u>		<u>Rating</u>
		<u>in. Spread (mm)</u>		
5	3 in 12	49	(1245)	A
6	5 in 12	90	(2286)	B
7	1 in 12	21.5	(546)	A
8	1 in 12	21	(533)	A
9	1 in 12	55	(1397)	A
10	1 in 12	58	(1473)	A
11	1 in 12	50	(1270)	A
12	1 in 12	54	(1372)	A
13	3 in 12	61	(1550)	A
14	5 in 12	69	(1753)	A

4.1.1 At no time during the Spread of Flame tests were flying brands developed or excessive lateral flame spreads observed.

4.4 FMRC Simulated Hail Damage Test Samples - Four 2 x 4 ft (1.2 x 2.4 m) test samples were prepared with the following sample constructions:

Sample No. 1:

1. Metal panel roof.
2. StableRust Primer was applied at 0.5 gal/sq (0.2 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: After each drop the sample was inspected for cracking, splitting, internal separation, delamination and rupture of the roof cover. After 10 drops of the impactor, the sample showed no sign of cracking, splitting, internal separation, delamination or rupture of the roof cover.

Sample No. 2:

1. 1.5 in. (38 mm) thick AC Foam-II covered with a 3 ply organic felt BUR.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 ℓ/m^2).
4. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: After each drop the sample was inspected for cracking, splitting, internal separation, delamination and rupture of the roof cover. After 10 drops of the impactor, the sample showed no sign of cracking, splitting, internal separation, delamination or rupture of the roof cover.

Sample No. 3:

1. 1.5 in. (38 mm) thick AC Foam-II covered with a 3 ply organic felt BUR.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by Premium Coat Fabric laid into the foundation coat. The Saturation coat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. Finish Coat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: After each drop the sample was inspected for cracking, splitting, internal separation, delamination and rupture of the roof cover. After 10 drops of the impactor, the sample showed no sign of cracking, splitting, internal separation, delamination or rupture of the roof cover.

Sample No. 4:

1. Concrecel lightweight insulating concrete.
2. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 ℓ/m^2).
3. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
4. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: After each drop the sample was inspected for cracking, splitting, internal separation, delamination and rupture of the roof cover. After 10 drops of the impactor, the sample showed no sign of cracking, splitting, internal separation, delamination or rupture of the roof cover.

4.5 FMRC Resistance to Foot Traffic Test Sample - Four sets of Foot Traffic Tests were completed with the following samples. All samples were prepared by applying the coating to the noted substrates.

Sample No. 1:

1. Metal panel roof.
2. StableRust Primer was applied at 0.5 gal/sq (0.2 ℓ/m^2).
3. FinishCoat was applied in two coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: After completion of testing, the sample was inspected for tearing and cracking of the protective cover. The sample showed no sign of tearing or cracking.

Sample No. 2:

1. 1.5 in. (38 mm) thick AC Foam-II covered with a 3 ply organic felt BUR.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 ℓ/m^2).
4. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: After completion of testing, the sample was inspected for tearing and cracking of the protective cover. The sample showed no sign of tearing or cracking.

Sample No. 3:

1. 1.5 in. (38 mm) thick AC Foam-II covered with a 3 ply organic felt BUR.
2. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: After completion of testing, the sample was inspected for tearing and cracking of the protective cover. The sample showed no sign of tearing or cracking.

Sample No. 4:

2. Concrecel lightweight insulating concrete.
2. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 ℓ/m^2).
3. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
4. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: After completion of testing, the sample was inspected for tearing and cracking of the protective cover. The sample showed no sign of tearing or cracking.

4.6 FMRC Susceptibility to Leakage Test - Four sets of Leakage Tests were completed with the following samples. All samples were prepared by applying the coating to a plastic sheet. After curing, the plastic sheet was removed for accelerated weathering and testing.

Sample No. 1:

1. StableRust Primer was applied at 0.5 gal/sq (0.2 ℓ/m^2).
2. FinishCoat was applied in two coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: The leakage test sample showed no signs of water leakage during the 7 day period. The roof cover ruptured while pressurizing the sample. Approval may be extended to this application when it is applied to the metal roof at a minimum slope of 0.5 in 12.

Sample No. 2:

1. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
2. BarrierGuard Slurry was applied at 0.5 gal/sq (0.2 ℓ/m^2).
3. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: The leakage test sample showed no signs of water leakage during the 7 day period nor during the pressurizing cycles.

Samples No. 3 & 4:

1. FoundationCoat was applied at 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat was then applied at 1.25 gal/sq (0.51 ℓ/m^2).
2. FinishCoat was applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2).

Results: The leakage test samples showed no signs of water leakage during the 7 day period nor during the pressurizing cycles.

V CONCLUSIONS

5.1 The test results indicate that the Hydro-Stop, Inc. PremiumCoat Roofing and Waterproofing Systems submitted for testing meets the FMRC Approval requirements when constructed as follows:

5.1.1 Steel deck, new construction - Minimum 1.3 in. (33 mm) thick Apache Pyrox insulation is secured to the deck using Olympic #12 screws and Standard Steel plates applied at 2 ft² (0.2 m²) maximum contributory area per fastener. Over the insulation, minimum 0.25 in. thick Dens Deck is adhered with rows of 3/4 to 1 in. (19 to 25mm) wide beads of Insta-Stick Roofing Adhesive spaced maximum 12 in. (305 mm) on center. PremiumCoat FoundationCoat is applied at 1.25 gal/sq (0.51 ℓ/m^2) at the insulation joints and 6 in. (152 mm) wide PremiumCoat Fabric is placed over the joints followed by a SaturationCoat applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2). FoundationCoat is applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the FoundationCoat providing for 4 in. (102 mm) wide laps. The SaturationCoat is then applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2) and allowed to dry. PremiumCoat Finish Coat is applied in two equal coats at a minimum combined rate of 1.5 gal/sq (0.61 ℓ/m^2). The first coating of PremiumCoat Finish Coat must dry prior to applying the second coating.

- A. Meets Class 1-90.
- B. Meets ASTM E108 Class A ratings at a maximum 1 in 12 roof slope.
- C. Meets Class 1-SH hail ratings.

5.1.2 Structural Concrete, new construction - Atlas AC Foam-II, Apache Pyrox, Johns Manville E"NRG"Y-2 or FMRC Approved EPS board is adhered to the deck with $\frac{3}{4}$ to 1 in. (19 to 25mm) wide beads of Insta-Stick Roofing Adhesive spaced maximum 12 in. (305 mm) on center. Over the insulation, minimum 0.25 in. thick Dens Deck is adhered with rows of $\frac{3}{4}$ to 1 in. (19 to 25 mm) wide beads of Insta-Stick Roofing Adhesive spaced maximum 12 in. (305 mm) on center. PremiumCoat FoundationCoat is applied at 1.25 gal/sq (0.51 ℓ/m^2) at the insulation joints and 6 in. (152 mm) wide PremiumCoat Fabric is placed over the joints. FoundationCoat is applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat providing for 4 in. (102 mm) wide laps. The Saturation Coat is then applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2) and allowed to dry. PremiumCoat Finish Coat is applied in two equal coats at a minimum combined rate of 1.5 gal/sq (0.61 ℓ/m^2). The first coating of PremiumCoat Finish Coat must dry prior to applying the second coating.

- A. Meets Class 1-270 with EPS insulation.
- B. Meets Class 1-225 with Apache Pyrox.
- C. Meets Class 1-150 Atlas AC Foam-II.
- D. Meets Class 1-105 with Johns Manville E"NRG"Y-2.
- E. Meets ASTM E108 Class A ratings at a maximum 1 in 12 roof slope.
- F. Meets Class 1-SH hail ratings.

5.1.3 Steel, Structural Concrete, recover construction over an existing FMRC Approved asphaltic BUR.

5.1.3.1 PremiumCoat FoundationCoat is applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat is then applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2) and allowed to dry. PremiumCoat Finish Coat is applied in two equal coats at a minimum combined rate of 1.5 gal/sq (0.61 ℓ/m^2). The first coating of PremiumCoat Finish Coat must dry prior to applying the second coating.

- A. Meets wind uplift rating of existing roof. Maximum Class 1-90.
- B. Meets ASTM E108 Class A ratings at a maximum 1 in 12 roof slope.
- C. Meets Class 1-SH hail ratings.

5.1.3.2 PremiumCoat FoundationCoat is applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat is then applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2). BarrierGuard Slurry is applied at 0.5 gal/sq (0.2 ℓ/m^2) and allowed to dry. PremiumCoat Finish Coat is applied in two equal coats at a minimum combined rate of 1.5 gal/sq (0.61 ℓ/m^2). The first coating of PremiumCoat Finish Coat must dry prior to applying the second coating.

- A. Meets wind uplift rating of existing roof. Maximum Class 1-90.
- B. Meets ASTM E108 Class A ratings at a maximum 3 in 12 roof slope.
Meets ASTM E108 Class B ratings at a maximum 5 in 12 roof slope.
- C. Meets Class 1-SH hail ratings.

5.1.4 Existing Approved Metal Panel Roofs - StableRust Primer is applied at a rate of 0.5 gal/sq (0.2 ℓ/m^2) to existing FMRC Approved insulated or uninsulated metal panel roofs and allowed to dry. PremiumCoat Finish Coat is then applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2). The first coating of PremiumCoat Finish Coat must dry prior to applying the second coating. The minimum roof slope is 0.5 in 12.

- A. Meets wind uplift rating of existing roof. Maximum Class 1-90.
- B. Meets ASTM E108 Class A rating at a maximum roof slope of 1 in 12.
- C. Meets Class 1-SH hail ratings.

5.1.5 Lightweight Insulating Concrete - Concrecel Concrete is placed over structural concrete, new or recover. BarrierGuard Slurry is applied to the lightweight concrete at rate of 0.5 gal/sq (0.2 ℓ/m^2) and allowed to dry. PremiumCoat FoundationCoat is applied at a minimum rate of 1.25 gal/sq (0.51 ℓ/m^2) followed by PremiumCoat Fabric laid into the foundation coat. The SaturationCoat is then applied at 1.25 gal/sq (0.51 ℓ/m^2) and allowed to dry. PremiumCoat Finish Coat is then applied in two equal coats at a combined rate of 1.5 gal/sq (0.61 ℓ/m^2). The first coating of PremiumCoat Finish Coat must dry prior to applying the second coating.

- A. Meets Class 1-360.
- B. Meets ASTM E108 Class A ratings at a maximum 1 in 12 roof slope.
- C. Meets Class 1-SH hail ratings.

5.2 The roof cover must be installed using an FMRC Approved perimeter flashing system. Refer to the current edition of the FMRC Approval Guide for details.

5.3 Test results show that the above roof constructions, in and of themselves alone, would not create a need for automatic sprinkler protection.

5.4 The tested roof systems, when installed as described above, meet the FMRC Approval Standards and when Approval is effective, will be listed in the FMRC Approval Guide, Roof Coverings section.

5.5 Approval is effective when the Approval Agreement is signed and received by FMRC.

5.6 Continued Approval depends on satisfactory field experience and periodic Quality Audit Inspections.

5.7 The securement of the roof system must be enhanced at the building corners and perimeter as outlined in Factory Mutual Loss Prevention Data Sheets 1-28 for roof decks and 1-29 for above deck components.

VI MARKING

6.1 The manufacturer shall mark each packing container (pail, drum or roll) with the manufacturer's name and product trade name. In addition, the container must be marked with the FMRC Approval Mark and the words: "Subject to the conditions of Approval as a protective roof coating for use in Class 1 roof construction as described in the current edition of the FMRC Approval Guide."

6.2 Markings denoting FMRC Approval shall be applied by the manufacturer only within and on the premises of manufacturing locations that are under the FMRC Facilities and Procedures Audit Program.

6.3 The manufacturer agrees that use of the FMRC name or Approval Mark is subject to the conditions and limitations of the FMRC Approval. Such conditions and limitations must be included in all references to FMRC Approval.

VII MANUFACTURERS RESPONSIBILITIES

7.1 To assure compliance with his procedures in the field, the manufacturer shall supply the roofer with necessary instructions or assistance required to produce the desired performance achieved in the tests.

7.2 Only contractors certified by the manufacturer shall be permitted to apply the Approved protective coating.

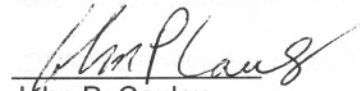
7.3 The manufacturer shall notify the FMRC of any planned change in the Approved product prior to the general sale or distribution to the public.


VIII QUALITY AUDIT INSPECTIONS AND REEXAMINATION

A reexamination and manufacturing inspection will be conducted periodically on the Approved product at the Approved manufacturing locations in Charleston, SC and Spartanburg, SC to determine that the quality and uniformity of the product has been maintained and will provide the same level of performance as originally tested.

TESTS AND REPORT BY:

REPORT REVIEWED BY:


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