CONSTRUCTION MATERIALS

TECHNOLOGIES

PERFORMANCE TEST REPORT

FOR

Gutter Covers International, LLC
Gutter Topper®

IN ACCORDANCE WITH

FLORIDA BUILDING CODE (HIGH-VELOCITY HURRICANE ZONES)
TEST APPLICATION STANDARD (TAS) 100-95
--USING TAS 100(A) DECK--

TEST PROCEDURE FOR WIND AND WIND DRIVEN RAIN RESISTANCE OF DISCONTINUOUS ROOF SYSTEMS

June 18, 2010

PRI Construction Materials Technologies, LLC. 6408 Badger Drive Tampa, FL 33610 Tel: 813-621-5777 Fax: 813-621-5840 e-mail: materialstesting@pricmt.com WebSite: http://www.priasphalt.com

PERFORMANCE TEST REPORT

FLORIDA BUILDING CODE (HVHZ) TEST PROTOCOL TAS 100-95
--USING TAS 100(A) DECK--

TEST PROCEDURE FOR WIND AND WIND DRIVEN RAIN RESISTANCE OF DISCONTINUOUS ROOF SYSTEMS

June 18, 2010

Client: Gutter Covers International, LLC
4111 Founders Boulevard
Batavia, OH 45103

Test Date: April 14, 2010
PRI Report No.: GTP-013-02-01

1.1 Description of Discontinuous Roof System:

Gutter System

Gutter Cover:	SEMCO, Gutter Helmet®
Gutter:	5" Standard Aluminum Gutter with Hangers and Fasteners
Fasteners:	1" Screws for Fascia Attachment 1/2" Screws for Gutter Attachment
Accessories:	End caps

Prepared Roof Covering

Field Shingles	ASTM D 3462 Asphalt Shingles
Product Description:	Laminated; 13-1/4" x 39-3/8"
Fasteners:	12ga, 1-1/4" galvanized ring shank nails
Metal Drip Edge:	Preformed; galvanized 26ga, 3" exposed edge
Roof Cement/Mastic	Asphalt Roof Cement
Product Description:	ASTM D 4586
Asphalt Primer	ASTM D 41 Asphalt Primer
Product Description:	ASTM D 41, Type II

Underlayment

Felt Underlayment	No. 30 Asphalt Saturated Felt
Product Description:	ASTM D226, Type II (No. 30)
Tin Caps:	32ga, 1-5/8" diameter
Fasteners:	12ga, 1-1/4" galvanized ring shank nails

1.2 Method of Roof Construction:

PRI Construction Materials Technologies constructed the test deck used for this testing as described in the following and in accordance with the requirements of TAS 100(A)-95. The TAS 100(A)-95 deck was used for this TAS 100-95 test in order to provide an appropriate eave edge for gutter installation and product application.

PRI Construction Materials Technologies applied the underlayment and prepared roof covering in accordance with manufacturers' published installation instructions and the minimum requirements set forth in Section 1518 of the Florida Building Code.

Deck

The plywood deck was constructed with standard 2" x 6" framing members, spaced 24" apart and 15/32" thick 4 ply APA 32/16 span rated sheathing. The sheathing was attached with 8d common nails placed 6" on center at the edges and 12" on center at intermediate supports.

Underlayment

The underlayment for this deck, ASTM D 226, Type II (No. 30) felt, was installed in accordance with the minimum requirements set forth in Section 1518 of the Florida Building Code. The underlayment was started at the eave; additional sheets were applied to cover the deck with a 4" overlap and minimum 6" end laps. The underlayment was fastened to the deck using 12ga, 1-1/4" galvanized ring shank nails through 32ga, 1-5/8" diameter tin caps placed 6" on center at edges and laps and staggered 12" on center in the field. Vertical laps at the valley were woven with the top ply extended a minimum of 12" past the valley center.

Prepared Roof Covering

Metal drip edge, galvanized 26ga and 3" exposed edge, was installed at the perimeter of the deck in a 1/8" thick layer of roof cement and fastened 4" on center in a staggered pattern using 12ga, 1-1/4" galvanized ring shank nails. Joints were overlapped a minimum of 4"; all overlaps and any gaps were sealed with roof cement. After fastening, the metal drip edge was primed with asphalt primer.

The field shingles, laminated asphaltic shingles, were installed per the manufacturer's installation instructions. With underlayment in place, a starter course was installed with 6-1/2" offset removed from the rake and 1/4" overhang on the eaves. The first shingle course was applied beginning at the rake edge with zero offset. Subsequent courses were applied with 6-1/2" offsets. Shingles were fastened with six (6) 12ga, 1-1/4" galvanized ring shank nails located approximately 6-1/8" from the bottom of the shingle. Fasteners were placed 1", 11", and 13" in from either shingle side. Shingle exposures were 5-5/8".

Gutter System

A 5" standard aluminum gutter system was applied at the eave edge of the test deck. The gutter was fastened to the eave with hangers and fasteners spaced 24" on center. The gutter was closed on either end with appropriate end caps. Gutter Topper's The Solution was applied over the gutter in accordance with the manufacturer's installation instructions.

The Southeastern Metals Manufacturing Gutter Helmet® was installed in compliance with the manufacturer installation instructions and with the components found in the instructions. These instructions are found in Appendix B.

1.3 Method of Conditioning

None required for Gutter Topper's The Solution.

1.4 Absorptive Material Description

The absorptive material used for the simulated rainfall calibration was 46ga organic felt.

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1.5 Photographs of Top and Underside of Deck Immediately Prior and Subsequent to Commencement and Termination of Testing.

TOP OF DECK IMMEDIATELY BEFORE COMMENCEMENT OF TEST

UNDERSIDE OF DECK IMMEDIATELY BEFORE COMMENCEMENT OF TEST

TOP OF DECK IMMEDIATELY AFTER TEST

UNDERSIDE OF DECK IMMEDIATELY AFTER TEST

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1.6 Photographs of Top and Underside of Deck 30 Seconds Prior to Completion of Each Testing Interval.

TOP OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 1: 35 MPH

UNDERSIDE OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 1: 35 MPH

TOP OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 2: 0 MPH

UNDERSIDE OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 2: 0 MPH

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TOP OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 3: 70 MPH

UNDERSIDE OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 3: 70 MPH

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TOP OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 4: 0 MPH

UNDERSIDE OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 4: 0 MPH

TOP OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 5: 90 MPH

UNDERSIDE OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 5: 90 MPH

TOP OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 6: 0 MPH

UNDERSIDE OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 6: 0 MPH

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TOP OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 7: 110 MPH

UNDERSIDE OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 7: 110 MPH

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TOP OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 8: 0 MPH

UNDERSIDE OF DECK 30 SECONDS PRIOR TO COMPLETION OF INTERVAL 8: 0 MPH

1.7 Wind stream, Simulated Rain Fall, and Flow Meter Calibration Data and Calculations. See Appendix A.

1.8 Detailed Observations.

TAS 100 DATA AND OBSERVATIONS
Southeastern Metals Manufacturing Company
Gutter Helmet

Slope: 2" in 12" **Air:** 74°F **Deck Conditioning:** None Required

Interval	Test Condition	Result
1	Wind Speed: 35 mph Water Spray: On Duration: 15 min	Wind Speed: Gutter displacement was not observed. Water Spray: Water infiltration was not detected.
2	Wind Speed: 0 mph Water Spray: Off Duration: 10 min	Wind Speed: Gutter displacement was not observed. Water Spray: Water infiltration was not detected.
3	Wind Speed: 70 mph Water Spray: On Duration: 15 min	Wind Speed: Gutter displacement was not observed. Water Spray: Water infiltration was not detected.
4	Wind Speed: 0 mph Water Spray: Off Duration: 10 min	Wind Speed: Gutter displacement was not observed. Water Spray: Water infiltration was not detected.
5	Wind Speed: 90 mph Water Spray: On Duration: 15 min	Wind Speed: Gutter displacement was not observed. Water Spray: Water infiltration was not detected.
6	Wind Speed: 0 mph Water Spray: Off Duration: 10 min	Wind Speed: Gutter displacement was not observed. Water Spray: Water infiltration was not detected.
7	Wind Speed: 110 mph Water Spray: On Duration: 5min	Wind Speed: Gutter displacement was not observed. Water Spray: Water infiltration was not detected.
8	Wind Speed: 0 mph Water Spray: Off Duration: 10 min	Wind Speed: Gutter displacement was not observed. Water Spray: Water infiltration was not detected.

Summary Observations The Gutter Covers International Gutter Topper® was not observed to move throughout the duration of the test.

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1.9 Volume of water, which infiltrated the sheathing at area of gutter installation.

None.

1.10 Water Infiltration through sheathing.

Not applicable in this test.

1.11 Gutter portions which blow off, tear, or blow upward without reseating:

The Gutter Topper® did not move during the duration of the test and up to 110 mph sustained wind velocity.

2.0 Result of Testing:

The Gutter Topper® was able to withstand 110 mph sustained wind velocity.

Signed: _____
Heath Coulombe
Laboratory Technician

Date: June 18, 2010

Signed: _____
Steven Mueller
Laboratory Technician

Date: June 18, 2010

Signed: _____
Donald C. Portfolio
President

Date: June 18, 2010

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APPENDIX A

FBC (HVHZ) TAS 100(A) - 95 CALIBRATION DATA

Detail for Report Section 1.7

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FBC (HVHZ) TAS 100(A) - 95 CALIBRATION PROCEDURES, DATA, AND CALCULATIONS

December 8, 2009

Windstream Calibration

Procedure: The windstream velocity calibration is conducted on a vertical plane grid measuring 8' wide by 4' high and grid dimensions of 2' by 2'. The plane is located in front of the wind tunnel exit. For each axial velocity setting, windstream pressures are measured using either a Dwyer Model 605-3 or 605-10 Magnehelic Differential Pressure Indicating Transmitter to a Dwyer Model 160-48 Pitot Tube. Velocity pressures for each grid square are observed as inches of water and converted to miles per hour according to the below relationship.

$$MPH = 12.4625\sqrt{P_V/_d}$$

where, P_V represents the velocity pressure in inH_2O and d represents the density of air in lbs/ft^3 adjusted for temperature, barometric pressure, and relative humidity.

The measured windstream velocity within each grid square shall be within ±10% of the required axial velocity for each wind speed.

Data and Calculations: Data from the most recent calibration indicate that the wind generator provides a suitably constant wind profile for the TAS 100-95 test procedure. Windstream velocity calibration data is provided in the table that follows on the next page.

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Windstream Velocity Calibration

Date of Calibration Procedure: **12/08/09** Next Due: **June-10**

Ambient Temperature:	77.0	°F
Barometric Pressure:	30.08	in Hg
Relative Humidity:	74	%

RPM	Grid Position	Velocity Pressure (in H_2O)	Windstream Velocity (mph)	Grid Position	Velocity Pressure (in H_2O)	Windstream Velocity (mph)	Grid Position	Velocity Pressure (in H_2O)	Windstream Velocity (mph)	Grid Position	Velocity Pressure (in H_2O)	Windstream Velocity (mph)
1500	1	0.60	35.6	2	0.50	32.5	3	0.60	35.6	4	0.60	35.6
	5	0.70	38.4	6	0.60	35.6	7	0.60	35.6	8	0.60	35.6
Target:	35 mph	Calibration: Each Grid Square shall be within ± 10% of 35 mph (31.5 - 38.5 mph)								Pass/Fail:		***Pass***
2600	1	2.1	66.6	2	2.0	65.0	3	2.2	68.1	4	2.3	69.7
	5	2.1	66.6	6	2.2	68.1	7	2.2	68.1	8	2.2	68.1
Target:	70 mph	Calibration: Each Grid Square shall be within ± 10% of 70 mph (63 - 77 mph)								Pass/Fail:		***Pass***
3500	1	3.9	90.7	2	3.7	88.3	3	3.8	89.5	4	4.0	91.9
	5	3.9	90.7	6	3.8	89.5	7	4.0	91.9	8	4.0	91.9
Target:	90 mph	Calibration: Each Grid Square shall be within ± 10% of 90 mph (81 - 99 mph)								Pass/Fail:		***Pass***
4200	1	5.6	109	2	5.3	106	3	5.8	111	4	5.7	110
	5	5.6	109	6	5.6	109	7	5.6	109	8	5.7	110
Target:	110 mph	Calibration: Each Grid Square shall be within ± 10% of 110 mph (99 - 121 mph)								Pass/Fail:		***Pass***

Simulated Rainfall and Flow Meter Calibration

Procedure: Water is supplied to the windstream via mounted sprinkle-pipes. Calibration is conducted in essentially two steps. First, the flow meter readings, in gal/min, are recorded, summed, and input into the following equation:

$$\left[\frac{\left(\frac{gallons}{minute}\right)\times\left(\frac{60\ minutes}{1\ hour}\right)\times\left(\frac{231\ inches^3}{1\ gallon}\right)}{11{,}520\ inches^2}\right]=\left(x\frac{inches}{hour}\right)$$

The quantity x determined above shall be within ± 5% of the desired rainfall simulation of 8.8 inches/hour.

Second, the quantity of water captured in one (1) minute is weighed, converted to volume, and input into the below equation:

$$\left[\frac{\left(\frac{inches^3}{11{,}520\ inches^2}\right)}{1\ minute}\times\left(\frac{60\ minutes}{1\ hour}\right)\right]=\left(y\frac{inches}{hour}\right)$$

The flow meter determination x shall be within ± 5% of the quantity y determined above.

Data and Calculations: Data from the most recent calibration indicate that an appropriate volume of water is applied during the TAS 100-95 test procedure. Simulated rainfall and flow meter calibration data is provided in the below table.

Simulated Rainfall and Flow Meter Calibration

Date of Calibration Procedure: **12/08/09** Next Due: **June-10**

X	Water Supply (gal/min)	Simulated Rainfall (in/hr)
Flow Meter #1	3.6	4.3
Flow Meter #2	3.6	4.3
Total	7.2	8.7
Simulated Rainfall		**8.7**
Target		8.8
Within ± 5% Tolerance		***Pass***

Y	Weight (lbs)	Volume (in^3)	Simulated Rainfall (in/hr)
Flow Meter #1	30.6	847.0	4.4
Flow Meter #2	30.7	849.8	4.4
Total	61.3	1696.8	8.8
Simulated Rainfall			**8.8**
Target			8.7
Within ± 5% Tolerance			***Pass***

Water Distribution Check

Procedure: The water distribution of simulated rain fall over the test frame was determined by placing a thick absorptive material on the deck sheathing, determining the amount of water absorbed during a set time interval, and verifying the water distribution profile within given tolerances. The procedure outlined in TAS 100-95 and was followed. The deck was set to a 2in:12in slope. The thick absorptive material used was 46 gauge organic felt. Wind driven rain was applied for approximately six (6) minutes. Each individual 2' x 2' wetted square was weighed using an Ohaus Model I-10 Scale.

The simulated rainfall calculated for each 2' x 2' wetted square shall be within either ±15% (at 35mph) or ±10% (at 70mph) of every other wetted square.

Data and Calculations: Data from the most recent calibration indicate that the wind generator and water supply system provides a suitably constant water distribution profile for the TAS 100-95 test procedure. Water distribution check data is provided in the table below.

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Water Distribution Check

Date of Calibration Procedure: **12/08/09** Next Due: **June-10**

Ambient Temperature:	77.0	°F
Barometric Pressure:	30.08	in Hg
Relative Humidity:	74	%

Windstream Velocity: 35 mph
Water Supply: 7.2 gal/min
Elasped Time: 6 min

Grid Position	Dry Felt (g)	Wetted Felt (g)	Simulated Rainfall (g)	Grid Position	Dry Felt (g)	Wetted Felt (g)	Simulated Rainfall (g)	Grid Position	Dry Felt (g)	Wetted Felt (g)	Simulated Rainfall (g)	Grid Position	Dry Felt (g)	Wetted Felt (g)	Simulated Rainfall (g)
20	185.0	576.0	391.0	15	182.0	534.0	352.0	10	180.0	543.0	363.0	5	188.0	574.0	386.0
19	183.0	584.0	401.0	14	185.0	574.0	389.0	9	185.0	590.0	405.0	4	189.0	635.0	446.0
18	189.0	588.0	399.0	13	184.0	585.0	401.0	8	185.0	594.0	409.0	3	188.0	630.0	442.0
17	178.0	536.0	358.0	12	183.0	599.0	416.0	7	185.0	574.0	389.0	2	188.0	615.0	427.0
16	191.0	589.0	398.0	11	189.0	599.0	410.0	6	189.0	607.0	418.0	1	187.0	587.0	400.0

Target: No one particular square sample shall exhibit a rainfall simulation greater than or less than 25% of the average of all square samples.

Average: 400.00 ⇒ Low Tolerance: 300.00
⇒ High Tolerance: 500.00 Pass/Fail: ***Pass***

Windstream Velocity: 70 mph
Water Supply: 7.2 gal/min
Elasped Time: 6 min

Grid Position	Dry Felt (g)	Wetted Felt (g)	Simulated Rainfall (g)	Grid Position	Dry Felt (g)	Wetted Felt (g)	Simulated Rainfall (g)	Grid Position	Dry Felt (g)	Wetted Felt (g)	Simulated Rainfall (g)	Grid Position	Dry Felt (g)	Wetted Felt (g)	Simulated Rainfall (g)
20	188.0	547.0	359.0	15	188.0	535.0	347.0	10	188.0	540.0	352.0	5	188.0	530.0	342.0
19	188.0	577.0	389.0	14	188.0	560.0	372.0	9	188.0	540.0	352.0	4	188.0	565.0	377.0
18	188.0	550.0	362.0	13	188.0	561.0	373.0	8	188.0	575.0	387.0	3	188.0	584.0	396.0
17	188.0	560.0	372.0	12	188.0	577.0	389.0	7	188.0	598.0	410.0	2	188.0	597.0	409.0
16	188.0	570.0	382.0	11	188.0	570.0	382.0	6	188.0	600.0	412.0	1	188.0	584.0	396.0

Target: No one particular square sample shall exhibit a rainfall simulation greater than or less than 25% of the average of all square samples.

Average: 378.00 ⇒ Low Tolerance: 283.50
⇒ High Tolerance: 472.50 Pass/Fail: ***Pass***

FBC (HVHZ) TAS 100(A)-95 CALIBRATION PROCEDURES, DATA, AND CALCULATIONS

Signed: Heath Coulombe
Heath Coulombe
Laboratory Technician

Date: June 18, 2010

Signed: Steven Mueller
Steven Mueller
Laboratory Technician

Date: June 18, 2010

Signed: Donald C. Portfolio
Donald C. Portfolio
President

Date: June 18, 2010

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APPENDIX B
Application Instructions

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Gutter Topper™

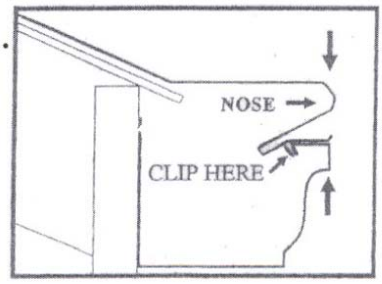
TESTED TO BE THE BEST ™

SIMPLE INSTALLATION INSTRUCTIONS

Installation is a breeze with Gutter Topper!

1. Gutter Topper® has been manufactured for an easy one person installation. Before you begin make sure all gutters, downspouts and underground lines are clean, running freely and angled properly.

A.

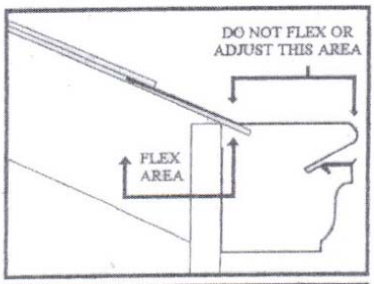


2. Gutter Topper® will work with 5" and 6" gutters, and will work on roofs from a 4/12 pitch through a 15/12 pitch. Gutter Topper® comes in 5' lengths and has a 1" pre-adjusted overlap so you can easily connect to your next piece of Topper®. Gutter Topper® clips easily onto the front of the gutter. (See Illustration A)

3. Gutter Topper® should be installed under the Second Row of roof shingles; in order to do this use a 12" drywall knife. Slide the drywall knife under the second row shingle, to loosen the tar seal. Once you have loosened the second row of shingles, determine the angle of the bend that is needed to install the Topper®. (On a 4/12 or 5/12 pitch roof a bend is not required. Palm pressure should be enough to flex the angle area. All other roof pitches require a Metal Break bend. This very slight slope is designed to drain the water completely, and for the surface tension area to perform correctly. DO NOT FLEX OR ADJUST THIS AREA. Bend Topper® accordingly to the pitch of the roof. (See Illustration B "Flex Area")

4. Slide the Gutter Topper® under the second row of now loosened shingles, and then slide the Gutter Topper® forward toward the gutter so as to clip the lip of the Gutter Topper® onto the lip of your gutter. (See Illustration B – Surface Tension Area.) Also see arrows in Illustration A.

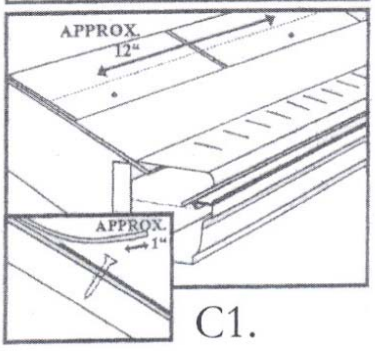
B.



5. Zip screw the Gutter Topper® to the gutter using a ¼" Hex Head extension on your drill. Hold back the surface tension area to prevent scratches. Using zip screws approximately every 12", attach the top lip of the Topper® to the top lip of the gutter.

6. After the Topper® has been placed under the shingles and the zip screws are in place on the top lip of the gutter, secure the Topper® to the roof deck with zip screws. To do this, lift the shingles and place a screw approximately every 12" (place screw in the center of the shingle). Once you have screwed the Gutter Topper® to the roof deck apply a small amount of sealant on top of the screw for two reasons: to seal out moisture over the screw, to reseal the shingle to the top of the Gutter Topper®. GEOCEL™ sealant is highly recommended, because it seals tight but remains pliable. Black roof tar is NOT recommended for the installation of Topper®. When resealing the shingles with sealant, push shingle down firmly. (See Illustration C and C1)

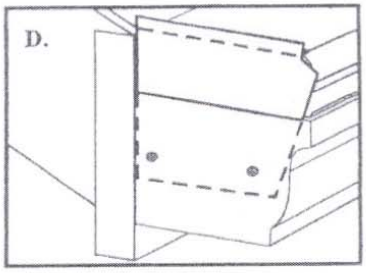
C.



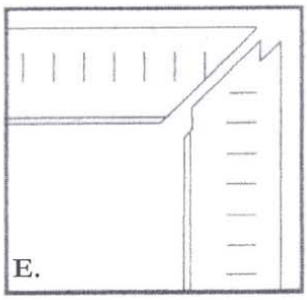
C1.

7. Once you have secured the Gutter Topper® to the roof and have resealed the shingles to the it, zip screw the pre-adjusted overlaps using 3 screws. NEVER SEAL THESE OVERLAP AREAS.

OVER THE SHINGLE INSTALLATION: If Gutter Topper® must be installed over the shingles be sure to seal all screws that secure the Topper® to the roof. HOWEVER, WE STRONGLY RECOMMEND THE UNDER THE SHINGLE INSTALLATION FOR BEST RESULTS.



8. Install end caps at the end of your gutters with zip screws to complete the low profile appearance of Gutter Topper®. End caps will complete Gutter Topper's® protection against the debris, birds and other objects. Cut back end cap section to match roof pitch, leaving a tab. (See illustation D)

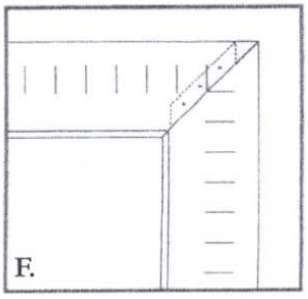


Corner installation is quick and easy with Gutter Topper®

1. For a 90 degree corner installation, cut one side of Topper® at a 45 degree angle. On the other side cut one large tab as shown in Illustration E.

2. Place these tabs under the corner of the first piece. See Illustration F.

3. Put 2 or 3 zip screws through the flat area to complete the simple corner installation. (See Illustration F)



Introducing the B-1 and B-2 Valley Diverters

4. To assure the proper flow of water in corners, you should also install Gutter Topper's® "valley diverters" with zip screws. In this illustraton we show the B-1 (recessed mount) diverter. Templates are also available for this application. (See Illustration G)

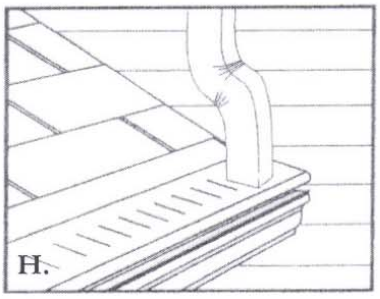
Special Note:

For roofs with water transfer from high gutters to low gutters, make sure that your downspout is fed into the lower gutter to assure proper water flow. (See Illustration H)

Remember, there's no need to make any other adjustments. Gutter Topper's® pre-adjusted openings assure easy installation and excellent water flow. If Gutter Topper® is not installed according to these instructions by a factory authorized dealer, the warranty will be null and void. Gutter Topper® may have some sharp edges—please use with caution.

FOR THE CURIOUS:

Gutter Topper® is designed for rainfall. When trying out your new Gutter Topper® DO NOT USE A GARDEN HOSE. Gutter Topper® will not function correctly when doing this. Gutter Topper® will work for you when it rains gently or very hard. Thank you for your patience, and enjoy watching Gutter Topper® work for you.



If you have questions about installation, refer to your manual or please call us at 800-915-5888 or 513-7975800.

Anthony M. Iannelli
Inventor & President