### ADHESIVE PULL TEST STANDARD TESTING PROCEDURES Determining Adhesive Strength

- 1. The test sample should include the following components:
  - a. Substrate (bare deck or existing roof).
  - b. Vapor or air barrier if included in the new system.
  - c. First insulation layer or VersiFleece<sup>®</sup> membrane (recover). If testing PVC or TPO VersiFleece, clean membrane, prime with appropriate bonding adhesive, let bonding adhesive fully flash off, then apply additional Flexible DASH<sup>™</sup> adhesive to attach plywood.
  - d. Attachment assembly (plywood).
- 2. The test sample must be 24" x 24".
- 3. The test area shall be prepared in the same manner as specified for the new roof.
- 4. Prepare the test area.
  - a. If the old roof is to be removed, this must be done in the test area before the test is performed. (Ensure the area is large enough for the pull tester to sit on the deck.)
  - b. If this is a recover, you must cut a 2-3" wide strip through the roof covering to the deck around the test sample area. This material must be removed. (Do not stand on the test area while cutting or removing the strip.)
- 5. The ambient and substrate temperatures must comply with all materials being used.
- A MINIMUM of 2 pull tests for a roof area of less than or equal to 50,000 sq. ft. is required. 2 additional pulls for each additional 50,000 sq. ft. is required.
- 7. Test locations shall be in areas of concern and should include perimeters and/or corners.
- 8. Test samples should not be in the same area or close to each other. (Looking to sample across the entire roof.)
- 9. Each roof with a different substrate or surface condition shall be considered an independent roof and shall be tested individually.
- 10. A diagram of the building and test areas is required for the approval of the system.
- 11. Cut a 24" x 24" piece CDX grade plywood with a minimum thickness of <sup>23</sup>/<sub>32</sub>".
- 12. Prepare the test area.
- 13. Apply primer and vapor barrier, if specified.
  - a. Apply primer at a proper coverage rate and allow for flash-off time.
    - i. When using CAV-GRIP<sup>®</sup> 3V Adhesive/Primer, apply at a coverage rate of 2,500 sq. ft./cylinder (small) and allow it to flash-off for a period of 45-60 minutes, depending on temperature.\*.



- When using CCW-702 Primer, apply to the substrate at a coverage rate of 300 sq. ft./gallon and allow it to flash off for a period of 1-2 hours, depending on temperature. \*
  - \* Colder temperatures require longer flash-off times.
- b. Apply the sample piece of VapAir Seal<sup>™</sup> 725TR over the primed area and roll with a seam roller to ensure proper contact.
- c. Wait at least 24 hours before completing the pull test.

Published uplift numbers on a 30 day cure period. Shorter periods will result in lesser uplift performance.

- 14. Using the proper bead spacing (4", 6", or 12" on center), align the bead on the substrate, centered on the test sample area, with successive beads applied toward opposite edges. Ensure that the beads start, turn, and end outside the test area. Beads are to be straight in the test area. (See Bead Spacing Diagram on the second page.)
- 15. Wait for proper string time, then install the rest of the roof test sample (i.e. insulation/membrane). Additional layers are not needed.
- 16. Apply roller/proper pressure to layer of roof sample to ensure proper adhesion to the substrate or vapor barrier.
- 17. Install piece of plywood with adhesive in a pattern that has more adhesive than previous layer. We do not want this layer to fail.
- 18. Apply pressure to ensure proper adhesion to test sample.
- 19. Test sample must cure for a minimum of 4 hours and be free of moisture and freezing temperatures.
- 20. After the test sample has cured, assemble the pull tester.
- 21. Install the attachment plate to the piece of CDX plywood that was glued to the test sample.
- 22. Place the tester over the test area and attach the pull chain to the plate.
- 23. Apply minimal pressure to the puller by turning the handle.
- 24. Ensure that the pull tester is centered over the sample and will apply perpendicular upward force.
- 25. Turn on tester gauge.
- 26. Once the tester is on and the gauge shows a numeric value, zero out the gauge by pressing the "ZERO" button.
- 27. Once the pull tester reads zero, raise the pressure to 60 lbs.
- 28. Hold the pressure for a MINIMUM of 60 seconds.



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- 29. Raise the pressure by increments of 60 psf every 60 seconds until the test sample fails or the tester load limit is reached.
- 30. Modes of failure:
  - a. Adhesive (loss of adhesive bond from substrate).
  - b. Cohesive (fracture of adhesive [still on deck and sample]).
  - c. Insulation facer delamination.
  - d. Insulation fracture.
  - e. Fleece delamination.
  - f. Separation from top of membrane.
- 31. Provide pictures of all failures and max readouts.

Please complete all forms attached with these instructions to ensure proper reporting.

### Instructions

Using the proper bead spacing (4", 6", or 12" on center), align the bead on the substrate, centered on the test sample area, with successive beads applied toward opposite edges. Ensure that the beads start, turn, and end outside the test area. Beads are to be straight in the test area.



VIEW THE PULL TEST VIDEO HERE

### **Bead Spacing Diagram**

Place beads centered on sample from center line of test area. See testing instructions # 14.













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#### **Day of Testing Forms**

To be completed by: \_\_\_\_\_

Job Name	Job Number
Address	Test Date
Ambient Temp	Roof Area sq. ft. (sq. m)
Tester Mfg./Model	Max. Cap. of Tester Ibf kN
Date of Last Calibration	Number of Tests Recorded on Form C
Insulation Manufacturer Insulation	ion Type Insulation Thickness
Adhesive Manufacturer	Adhesive Type
Test Performed by	Witnessed by
Test Cut Areas Repaired by (Name and Company)	Project Type: New Construction Tear-Off Retrofit

#### **Deck Type**

Steel	Gypsum
Gauge:	Thickness:
Structural Concrete	Check One: Poured in Place Precast
Thickness:	Wood
Check One: Poured in Place Precast	Thickness:
Lightweight Concrete	Check One: OSB Plywood Plank
Thickness:	Fiberglass
Insulating Concrete	Thickness:
Thickness:	Other
Cementitious Wood Fiber	Thickness:
Thickness:	

#### **Requesting Party:**

Name:
Company:
Title:
Phone:
Email:



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Versico, PO Box 1289, Carlisle, PA 17013 Tel: 800.992.7663 Fax: 717.960.4036 Web: www.versico.com

#### **Optional Information**

Test Time:	Modified Bitumen
Building Height:	Built-up Roofing
Thickness of Existing Roof Assembly:	Fully Adhered Single-ply
New Roofing System Manufacturer:	Other:

### Roof Layout (not to scale)

Identify where tests were performed.





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Roof Cover Type (check one):

### **Overall Testing Results**

Test Number	Location on Roof Drawing (Page 4)	Measurement Pounds Force (# on Tester, step 29)	Pressure Rating	Mode of Failure
Example	A, B, C, D, etc.	240	(240/4=60) <b>60</b>	See examples below
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

### Modes of Failure

- Adhesive (loss of adhesive bond from substrate)
- Cohesive (fracture of adhesive [still on deck and sample])
- Insulation facer delamination
- Insulation fracture
- Fleece delamination
- Separation from top of membrane
- Deck failure



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#### **Pull Test Measurement Page**

- 1. Once the pull tester reads '0', raise the pressure to 60 lbs.
- 2. Hold the pressure for a MINIMUM of 60 seconds.
- 3. Check box and then raise to next pressure.
- 4. Raise the pressure by increments of 60 lbs every 60 seconds until the test sample fails or the tester load limit is reached.

Measurement on equipment	Test 1	Test 2	Test 3	Test 4	Test 5
60					
120					
180					
240					
300					
360					
420					
480					
540					
600					
660					
720					
780					
840					
900					
960					
1020					
1080					
1140					
1200					
1260					
1320					
1380					
1440					
1500					
1560					
1620					
1680					
1740					
1800					
1860					
1920					
1980					
2040					