PECORA CORPORATION
Architectural Weatherproofing Products
U.S.A. • since 1862

PEC 220 Technical Bulletin
Pecora Fluid Applied Wall Coating & Primer
All Field Test Procedures

The following field test procedures are recommended to evaluate the adhesion of Pecora's fluid applied wall coatings when in-service or a component of a pre-construction mockup. Both qualitative and quantitative methods are listed below. Quantitative field adhesion test methods are preferred or required for warranty purposes. All field test results must be documented and submitted to Pecora Technical Service for review. Photos and/or videos of the field testing are encouraged.

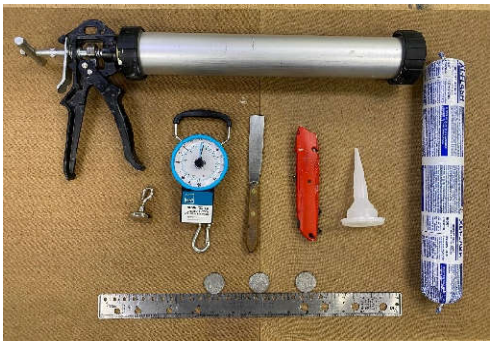
Table #1 - Acceptable Field Test Procedures for Warranty Purposes, by Product

Fluid Applied Coating/s	Warrantable Test Method, YES or NO		
	ASTM D4541 Pull Off Adhesion Strength (Standard and Modified)	ASTM C794 Peel Adhesion Strength	ASTM D3359, Method A (X-cut) or Method B (Cross Hatch)
Pecora XL-Perm VP Pecora XL-Perm NP Pecora ProPerm VP	YES	n/a	NO
Pecora SilcoPrime w/ Exterior Coating	YES	YES	NO*
Pecora WeatherClad Pecora WeatherClad WT	YES	YES	YES

**Exceptions when agreed upon by exterior coating manufacturer and Pecora Corp.*

QUANTITATIVE Test Methods – ASTM D4541 Pull Off Adhesion Strength (Modified)

The purpose of this test is to quantify the adhesive strength of a coating to determine whether the installation has been completed properly and acceptable adhesion is achieved. Release or separation during the test will occur along the weakest part of the material or bond between the material and the substrate. Poor adhesion may be caused by poor substrate preparation, partially cured coating and/or improper coating application. The modified field adhesion test method presented here is based on the methods published in ASTM D4541 Standard Test Method for Pull Off Adhesion Strength of Coatings Using a Portable Adhesion Tester.



Items required for modified test procedure:

- **High Strength Magnet** (minimum 50lb pull) with eye bolt
- **Luggage Scale** with carabiner or locking clip (minimum 50lbs capacity)
- **Steel Coupons** (aka test dolly); white metal finish & 1in^2 surface area
- **Test Dolly Adhesive** (refer to Table #2)
- **Flat Blade Caulking Knife, Razor Knife**
- **Bulk Caulking Gun, Plastic Nozzle**

ASTM D4541 (Modified) Test Preparation:

- Attach a steel test dolly to the fluid applied coating material to be evaluated using a non-sag type liquid adhesive. Maintain adhesive thickness at 1/16" to 1/8". Refer to the table #1 for Pecora recommended test dolly adhesives.
- All fluid applied coatings should be fully cured per the manufacturer's instructions prior to attaching the test dollies. Be aware that attaching a test dolly to a partially cured coating may retard the cure and negatively affect the test results.
- Allow test dolly adhesive to fully cure per the recommendations in Table #1 prior to performing the testing. Do not disturb the test dolly during the specified cure period.

Table #2 – Recommended Steel Coupon (Test Dolly) Adhesives

Fluid Applied Coating/s	Recommended Test Dolly Adhesive/s	Minimum Test Dolly Adhesive Cure Time @ 75°F/50%rh
Pecora XL-Perm VP Pecora XL-Perm NP Pecora ProPerm VP	(1) Pecora XL-Flash Liquid Flashing and Joint Filler (2) Pecora AVB Silicone	7 – 10 days
Pecora SilcoPrime w/ Exterior Coating[1, 2]		
Pecora WeatherClad Pecora WeatherClad WT		

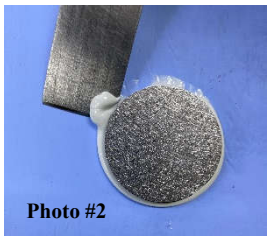
[1] *Test dolly adhesive to be adhered to the post-applied exterior coating and not directly to the SilcoPrime primer.*
[2] *Consult Pecora Technical Service for test dolly adhesive recommendations based on the exterior coating type used.*

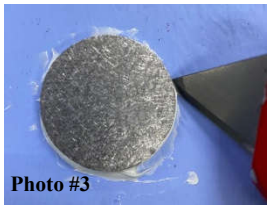
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QUANTITATIVE Test Methods – ASTM D4541 Pull Off Adhesion Strength (Modified) cont.


Photo #1


Photo #2


Photo #3

ASTM D4541 Test Procedure (Modified):

1. **Locate a 6" x 6" unobstructed area to perform the adhesion test**. Testing should be completed on each type of substrate coated with a Pecora fluid applied coating/primer.
2. **Clean the test area** with a solvent wipe (isopropyl or denatured alcohol preferred) and allow to dry.
3. **Apply a small dollop of Pecora XL-Flash** to the surface that will allow full embedment of the steel coupon. See Photo #1.
4. **Apply the 1" x 1" steel coupon** firmly into the wet XL-Flash allowing for slight squeeze out. Immediately remove excess squeeze out (see Photo #2). Allow for an approximately 1/8" thick film of adhesive between the substrate and coupon.
5. **Allow the XL-Flash to fully cure**. Low ambient temperatures (<50F) will extend the cure time.
6. **Lightly score around the entire perimeter of the steel coupon** down to substrate. See Photo #3.
    a. If applied over an exterior grade gypsum sheathing substrate avoid cutting into the gypsum core.
7. **Attach the magnet** centered on the coupon.
8. **Attach the scale to eyelet and begin the test** by pulling the scale at a slow and steady rate until failure occurs or a designated minimum value is achieved. Refer to Table #3 for minimum values per product.

Once the test is complete, you will need to record maximum pounds-force achieved, the type of release, the surface in which the release occurred, and the percentage of release on each surface. This information should be noted in the test log.

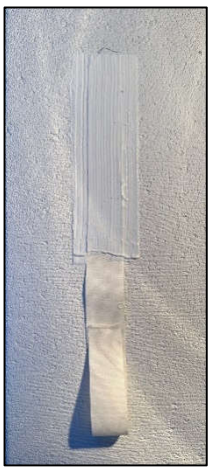
NOTE: ASTM D4541 Pull Off Adhesion Strength testing performed with Elcometers or comparable portable testers are also acceptable for warranty purposes. Refer to the test device manufacturer's guidelines or consult Pecora Technical Service for test procedures.

Table #3 – Minimum Pull-Off Adhesion Strength Values per Product

Fluid Applied Coating/s	Minimum Pull Off Adhesion Strength, PSI
Pecora XL-Perm VP, Pecora XL-Perm NP Pecora ProPerm VP	16.0*
Pecora SilcoPrime w/ Exterior Coating	50.0
Pecora WeatherClad, Pecora WeatherClad WT	50.0

** Minimum pull off adhesion strength per ABAA (Air Barrier Association of America)*

QUANTITATIVE Test Methods – ASTM C794 Peel Adhesion Strength



The purpose of this test is to quantify the adhesion of a coating via a peel adhesion strength test to determine whether the installation has been completed properly and acceptable adhesion is achieved. Release or separation during the test will occur along the weakest part of the material or bond between the material and the substrate. Poor adhesion may be caused by poor substrate preparation, partially cured coating and/or improper coating application. **Minimum peel adhesion strength is 5 pli (pounds per lineal inch).**

C794 Test Procedure

1. **Locate a 6" x 6" unobstructed area to perform the adhesion test**. Testing should be completed on each type of substrate coated with a Pecora fluid applied coating/primer.
2. **If necessary, clean the test area** with a solvent wipe (isopropyl or denatured alcohol preferred) and allow to dry.
3. **Cut 1" x 12" piece of airplane cloth (Grade A / FAA-TSO-0158).** *********Pecora Technical Service can provide samples of airplane cloth upon request*********
    a. SilcoPrime: Apply exterior coating over existing silicone coating primed with SilcoPrime per manufacturer's instructions to create a 2" x 6" test area.
    b. Air Barrier and WeatherClad: Apply coatings directly over the substrate to create a 2" x 6" test area.
4. **Embed the airplane cloth** by immediately placing the cloth directly over the newly applied coating and lightly press into place taking care not to displace the underlying coating.
5. **Apply a small amount of coating over the airplane cloth to fully encapsulate.** Refer to adjacent photo of assembled peel adhesion field test sample with airplane cloth.
6. **Allow coating to fully cure** per manufacturer's guidelines.
7. **Attach a (luggage/fish) scale to the exposed airplane cloth tab and peel the tab back at an 180° angle** by applying slow and steady pressure. A minimum 5pli is required for warranty purposes. Adhesive failure of the coating prior to achieving 5pli is considered a failing result.
8. **Record test results** and submit to your local Pecora field representative and/or Pecora Technical Service Group.

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QUALITATIVE Test Method – ASTM D3359 Measuring Coating Adhesion by Tape, Method A (X-Cut) & Method B (Cross Hatch)

In the event quantitative pull off adhesion testing is unable to be performed as described above, a qualitative coating adhesion evaluation may be performed via the ASTM D3359, Method A (X-cut) or Method B (Cross Hatch) procedure. Per ASTM, Method A (X-cut) is recommended for coatings greater than 5 mils DFT and Method B (Cross Hatch) for coatings less than 5 mils DFT. These test methods will assess the coating's adhesive performance by applying and removing a pressure-sensitive tape over cuts made in the coating. Tape should be 1.0" wide semi-transparent pressure-sensitive tape. The tape recommended for use, Permacell P-99, was discontinued and the current alternatives include: Elcometer 99 Adhesion Tape and other generic brands. **Painter's tape is not acceptable for this test method.** Consult Pecora Technical Services for acceptable tapes.

Method A (X-cut) Procedure (coatings >5 mils DFT):

1. Select test areas that are free of defects. Ensure test area is clean, dry and coating is fully cured.
2. Make "X" cut with a razor knife. Each cut should be ~1.5" in length that intersect at an angle between 30° and 45°. Cut through the coating down to the underlying substrate.
3. Apply a fresh lap of tape over the "X" cut. Place the tape directly over the center of the "X". Proceed to Step #4.

Method B (Cross Hatch) Procedure (coatings <5 mils DFT):

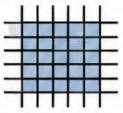
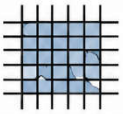
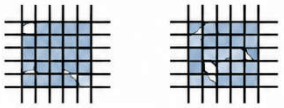
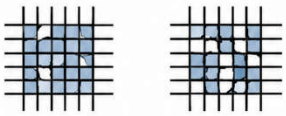
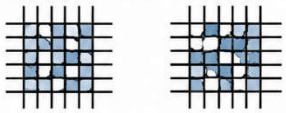
1. Select test areas that are free of defects. Ensure test area is clean, dry and coating is fully cured.
2. Make six (6) cuts spaced 2mm apart. Each cut should measure ¾" long. Cut through the coating down to the underlying substrate.
3. Apply a fresh lap of tape over the cross hatch cut. Place the tape directly over the center of the grid. Proceed to Step #4.
4. Firmly press the tape with finger to ensure intimate contact with the coating.
    a. Areas that are not well adhered will be visible through the semi-transparent tape. Rubbing a pencil eraser over the tape test area is good practice and will ensure the tape is well adhered to the underlying coating surface.
5. Remove the tape within one minute by pulling off rapidly upon itself at a 180° angle.
6. Inspect the test area for coating removal from substrate. No peeling or removal of coating is preferred. Classify each test result per the applicable tables below.
7. Report the number of tests and locations.

Pass Criteria: A result of 4A or 4B or better is required for warranty purposes

Method A (X-cut) Coating Adhesion Scale

Coating Failure Description	Classification of Test Results
No peeling or removal	5A
Trace peeling or removal along incisions or at their intersection	4A
Jagged removal along incisions up to 1.6mm on either side	3A
Jagged removal along most of incisions up to 3.2mm on either side	2A
Removal from most of the area of the "X" under the tape	1A
Removal beyond the area of the "X"	0A

Method B (Cross Cut) Coating Adhesion Scale

CLASSIFICATION OF ADHESION TEST RESULTS		
CLASSIFICATION	PERCENT AREA REMOVED	TYPICAL APPEARANCE OF CROSS-CUT AREA AFTER SIX PARALLEL CUTS IN EACH DIRECTION AND APPROXIMATE PERCENT AREA REMOVED
5B	0% None	
4B	< 5%	
3B	5 – 15%	
2B	15 – 35%	
1B	35 – 65%	
0B	> 65%	

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