

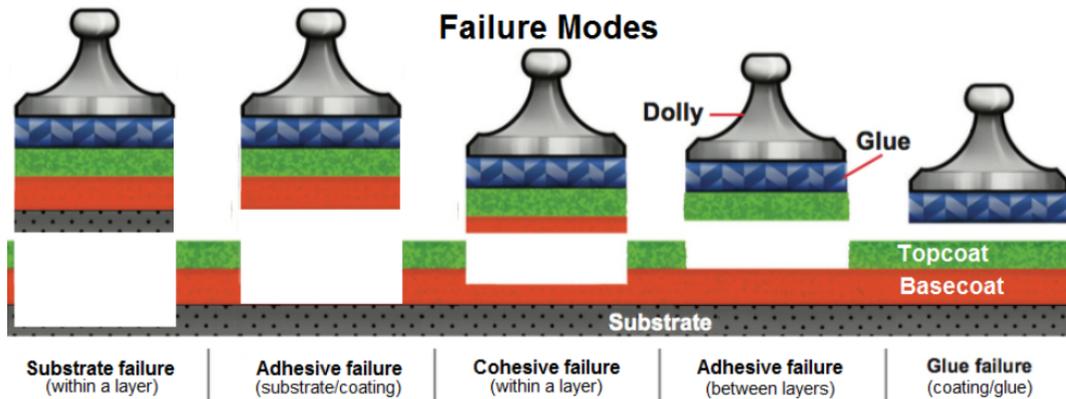


Adhesion Testing Pocket Guide

QA for proper:

- Substrate quality
- Surface preparation
- Coating application





- **Substrate failure:** Failure occurs within the substrate layer (substrate is on the dolly and the structure).
- **Cohesive failure:** Failure occurs within the coating layer (same coating on the dolly face and the coated surface).
- **Adhesive failure:** Failure occurs at the interface between two layers (coating on the dolly face differs from the surface).
- **Glue failure:** Failure occurs in the separation of the glue from itself, the coating, or the dolly (no coating visible on the dolly face).

Equipment Requirements



Testing apparatus, Epoxy adhesive, mixing stick, fine grit sandpaper, clean rags, solvent, duct tape, Permanent marker, scoring device (if required)

Test Procedure



Glue



Secure



Core



Pull



Interpret

COATING ADHESION TEST RESULTS

Location: North Wall
Scored Around Dolly: Yes
Pull-Off Strength: 586 psi
Failure Mode: Acceptable
50% Cohesive failure
50% Adhesive failure

Record

1. Select test area: Smooth & flat for dolly contact
2. Lightly abrade surface for dolly
3. Clean & abrade test area of dolly
4. Mark area and dolly with test number
5. Document location test area, environmental conditions and temperature
6. Apply minimum adhesive to surface area and contact surface of dolly
7. Place dolly on contact area and remove excessive adhesive
8. Secure dolly with duct tape to allow adhesive to dry and adhere
9. Allow adhesive to dry, per manufacturer's recommendations (Minimum 12 hours @ 75°F)
10. Remove duct tape & confirm adhesion to coating
11. Slowly score the coating to the substrate, with minimal pressure to achieve an even cut, without disrupting the dolly or substrate. (If dolly dislodged or compromised, discard that sample)
12. Zero the testing gauge
13. Carefully attach and align testing apparatus, without putting any pressure on the dolly
14. Run the adhesion test and record the force attained on the film and in a log
- 15.
16. Document percent adhesive and cohesive failure

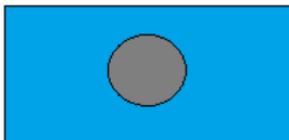
Examples

Dolly Face



**100% Substrate failure
(within substrate)**

Coated Surface

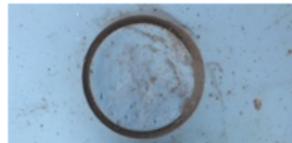
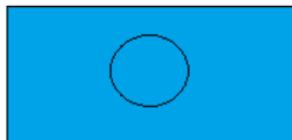


Dolly Face



**100% Cohesive failure
(within coating)**

Coated Surface

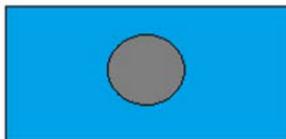


Examples

Dolly Face



Coated Surface

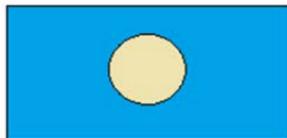


**100% Adhesive failure
(between coating & substrate)**

Dolly Face



Coated Surface



**100% Glue failure
(between dolly & coating)**

Acceptable Adhesion

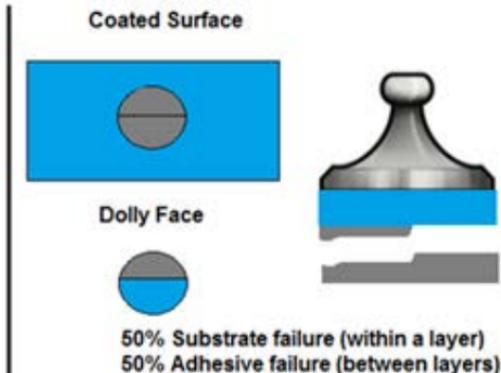
200 to 500 psi with a minimum 85% Substrate

OR

Greater than 500 psi

The mode of failure is as important as the resulting value (psi) for determining the integrity of coatings on concrete

Interpretation of Results



Location: North Wall of MH at 4' up from bench

Acceptable test results: Yes

Pull-Off Strength: 586 psi

Failure Mode: 50% Cohesive failure within the substrate /
50% Adhesive failure between the coating and the substrate

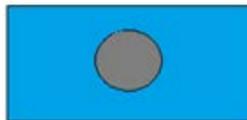
Observed Coating Thickness: N/A

Evaluation: The coating exhibited expected strength when subjected to the test and did not separate 100% within the substrate. With the strength of the pull, this test is acceptable according to the specification. (Greater than 500 psi)

Interpretation of Results



Coated Surface



Dolly Face



100% Substrate failure (within a layer)



COATING ADHESION TEST RESULTS & EVALUATION

Location: Bench, west side of the invert (dolly #2)

Acceptable test results: questionable

Pull-Off Strength: 142 psi

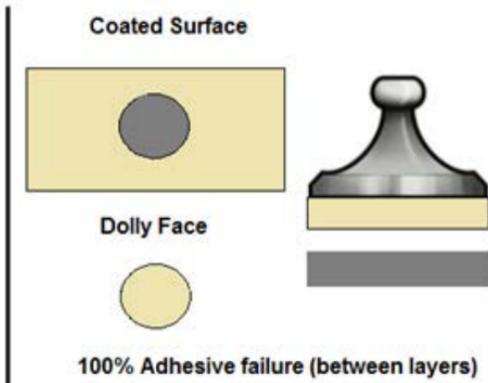
Failure Mode: 100% Cohesive failure within the substrate

Observed Coating Thickness: Yes, 128 mils

Evaluation: The coating adhered to the substrate with 100% cohesive failure within the substrate.

Coating adhered to a weak substrate, with 100% cohesive failure. Owner should evaluate original substrate due to weak substrate strength.

Interpretation of Results



COATING ADHESION TEST RESULTS & EVALUATION

Location: Clarifier floor, east side by manway entry

Acceptable test results: Yes

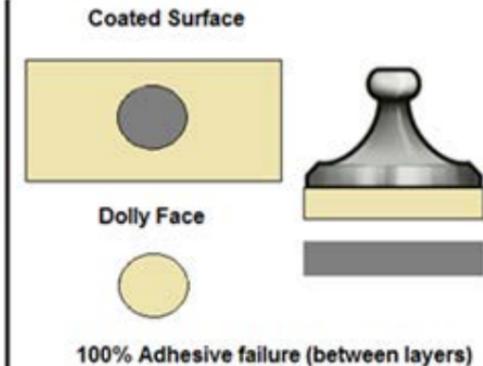
Pull-Off Strength: 1001 psi

Failure Mode: 100% Adhesive failure

Observed Coating Thickness: Yes, 210 mils

Evaluation: Coating failure was NOT within the substrate. Due to the high PSI strength (over 500) of the pull. This test is acceptable.

Interpretation of Results



COATING ADHESION TEST RESULTS & EVALUATION

Location: Upper left corner of wet well #8

Acceptable test results: No

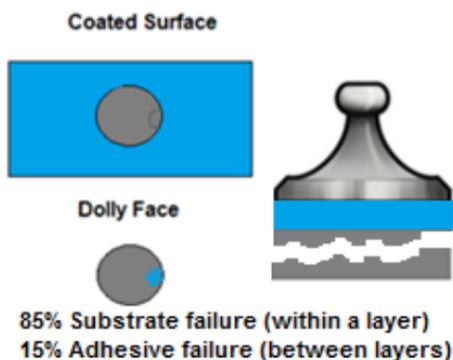
Pull-Off Strength: 225 psi

Failure Mode: 100% Adhesive failure

Observed Coating Thickness: N/A

Evaluation: Coating failure was NOT within the substrate. Due to the low PSI strength and lack of substrate on the dolly, this test is NOT acceptable.

Interpretation of Results



COATING ADHESION TEST RESULTS & EVALUATION

Location: Tank #213 floor, below ladder

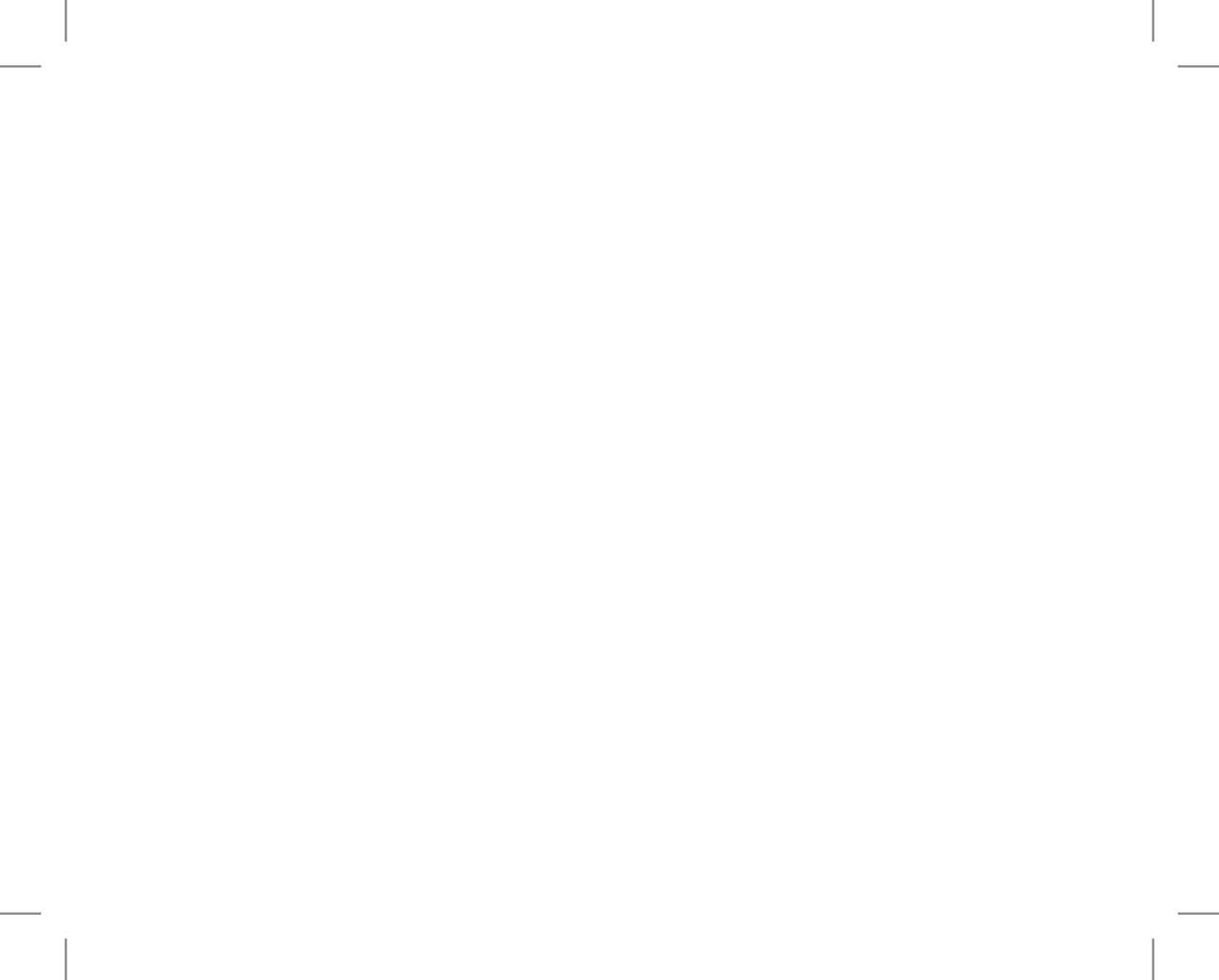
Acceptable test results: Yes

Pull-Off Strength: 326 psi

Failure Mode: 85% cohesive failure within substrate / 15% adhesive failure

Observed Coating Thickness: 125 mils

Evaluation: Failure was 85% within the substrate. With the combined substrate percentage and PSI strength on the dolly, this is an acceptable pull.



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