

**TESTING APPLICATION STANDARD (TAS) 123-95
APPENDIX A**

**STANDARD REQUIREMENTS OF TILE ADHESIVE USED
TO REPAIR OR SUPPLEMENT TILE ATTACHMENT**

1. Scope:

- 1.1 This protocol covers the testing requirements for tile adhesive applied to Product Approved nail-on, mortar set or adhesive set tile systems.
- 1.2 All testing shall be conducted by an approved testing agency and all test reports shall be signed by an authorized signer of the testing agency and/or professional engineer.

D 2565 Operating Xenon Arc-type Night Exposure Apparatus With and Without Water for Exposure of Plastics

E 380 Excerpts from Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)

2. Referenced Documents:

2.1 *ASTM Standards:*

- C 661 Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer
- C 1021 Standard Practice for Laboratories Engaged in the Testing of Building Sealants
- D 95 Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation
- D 412 Standard Test Method for Rubber Properties in Tension
- D 572 Standard Test Method for Rubber Deterioration by Heat and Oxygen
- D 897 Standard Test Method for Tensile Properties of Adhesive Bonds
- D 1079 Standard Definitions of Terms Relating to Roofing, Waterproofing, and Bituminous Materials

2.2 *Application Standards:*

TAS 101 Test Procedure for Static Uplift Resistance of Mortar or Adhesive Set Tile Systems

TAS 102 Test Procedure for Static Uplift Resistance of Mechanically Attached, Rigid, Roof Systems

2.3 *Roof Consultants Institute Glossary of Terms*

3. Terminology and Units:

3.1 Definitions—For definitions of terms used in this Protocol, refer to ASTM D 16; and/or ASTM D 1079; and/or Chapter 2 of the *Florida Building Code, Building*; and/or The RCI Glossary of Terms. Definitions from the *Florida Building Code, Building* shall take precedence.

3.2 Units—For conversion of U.S. customary units to SI units, refer to ASTM E 380.

4. Significance and Use:

- 4.1 This protocol appendix applies only to tile adhesives used in tile systems as a:
- repair component for mortar or adhesive set tile applications; or,
 - supplement to the attachment in a nail-on tile application.

5. Test Limitations and Precautions:

5.1 The protocol may involve hazardous materials, operations and equipment. This protocol does not purport to address all of the safety problems associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

6. Materials and Manufacture:

6.1 Tile adhesive used for the purposes of tile repair or supplemental attachment shall consist of a synthetic rubber and resins or such other base component material that will comply with the undernoted performance and physical characteristics.

6.2 Colors shall be tan, terra-cotta, gray or such other color which blends with tile coloring.

7. Sampling:

7.1 Sampling shall be in compliance with requirements set forth in ASTM C 1021. Particular reference is made to Subsection 5.2.1 of the procedure.

8. Performance Testing & Requirements:

8.1 Composition:

8.1.1 Water content—Tile adhesive shall meet the maximum water volume percentage noted in Table 1, below, when tested in compliance with Section 9 of ASTM D 95.

8.1.2 Nonvolatile matter—Tile adhesive shall meet the minimum nonvolatile matter mass percentage noted in Table 1, below, when tested in compliance with ASTM D 2369.

TABLE 1
TILE ADHESIVE COMPOSITION REQUIREMENTS

Component	Criteria	Value
Water	Volume %	Maximum 1.5%
Nonvolatile Matter	Mass %	Minimum 65% + 5%

8.2 Uniformity—A thoroughly blended sample of tile adhesive shall show no separation of material after standing for 72 hours at room temperature (73.3° ± 3.6° F) in a closed container.

8.3 Workability—The tile adhesive shall be of such a consistency that it is easily forced from a tube with a 1/4 inch diameter hole with a hand held caulk gun at temperatures ranging from 40°F (4°C) to 100°F (38°C).

8.4 Adhesion—Tile adhesive shall meet the minimum adhesion requirements noted in Table 2, below, when tested in compliance with ASTM D 897.

TABLE 2
TILE ADHESIVE ADHESION REQUIREMENTS

Bonded Component Interface	Conditioning	
	3000 hours @ 72°F (22.2 °C)	3000 hours @ 180°F (82.2 °C)
Concrete to Mortar	65 psi	35 psi
Concrete to Concrete	100 psi	143 psi
Concrete to Wood	85 psi	70 psi
Clay to Clay	128 psi	128 psi
Slate to Slate	112 psi	199 psi

8.5 Tensile/elongation—Tile adhesive shall meet the minimum requirements noted in Table 3, below, when tested in compliance with ASTM D 412.

TABLE 3
TILE ADHESIVE TENSILE/ELONGATION REQUIREMENTS

Physical Property	Conditioning	
	3000 hours @ 72°F (22.2 °C)	1000 hours @ 158°F (70.0 °C)
Tensile Strength	1000 psi	1200 psi
Elongation	400%	370%
Modulus	700 psi	NA

8.6 Static uplift resistance—Tile adhesive shall be tested for resistance to static uplift loading in compliance with TAS 102, except as noted below.

8.6.1 Test specimen:

- The test specimen shall include high profile, concrete “S-shaped” tiles mechanically attached directly to the deck with a single 8d annular ring shank nail.

- Tile adhesive shall be applied at the 'test tile' headlap in a single $\frac{3}{8}$ inch wide by $1\frac{1}{4}$ inch long bead placed between $1\frac{1}{2}$ inches and 2 inches from the nose of the 'test tile.'
- The test specimen shall be conditioned as specified in Section 8 of TAS 101.

8.6.2 Calculations:

- Calculations need not include those for restoring moment due to gravity or attachment resistance expressed as a moment.

8.6.3 Requirement:

- The tile attachment, when installed in compliance with Section 8.6.1, shall provide a minimum characteristic resistance load (F') not less than 35 lbf.

8.7 Shore 'A' hardness - Tile adhesive shall meet the minimum requirements noted in Table 4, below, when tested in compliance with ASTM C 661.

TABLE 4
SHORE 'A' HARDNESS REQUIREMENTS

Conditioning	Hardness	Flexibility
Unconditioned	80 + 5	flexible
4 months @ 158°F (70°C) 1000 hours of UV Exposure (ASTM D 2565)	80 +7 80 +7	flexible flexible
1000 hours O ₂ Bomb @ 158°F (70°C) (ASTM D 572)	80 +7	flexible
2000 hours O ₂ Bomb @ 158°F (70°C) (ASTM D 572)	80 +7	semi-flexible

9. Packaged Material:

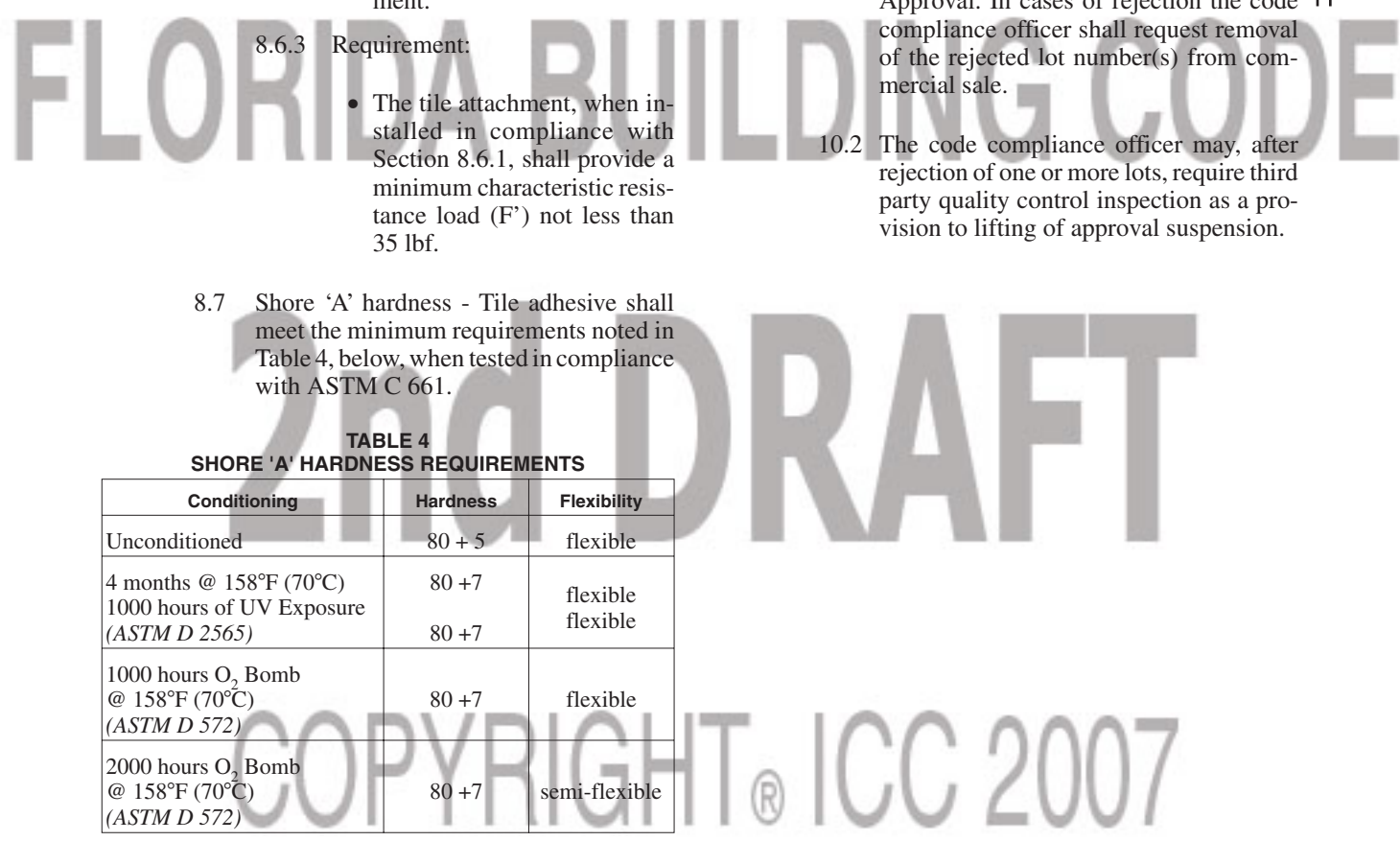
9.1 Packaged material shall be certified by the manufacturer to be in compliance with the provisions of this protocol and shall be labeled in compliance with Section 1517 of the Florida Building Code, Building. Product Approval documents shall be provided to the purchaser or end user upon request.

9.2 Shipping containers shall be marked with the name of the material, stock number, lot number, year of issue and quantity therein and the name of the manufacturer or supplier.

10. Rejection and Reinspection:

10.1 The chief code compliance officer may periodically purchase commercial quantities of the Approved product for testing to confirm compliance with the provisions of this protocol. Failure to meet the minimum requirements set forth in this protocol shall constitute grounds for rejection of the lots and suspension of the Product Approval. In cases of rejection the code compliance officer shall request removal of the rejected lot number(s) from commercial sale.

10.2 The code compliance officer may, after rejection of one or more lots, require third party quality control inspection as a provision to lifting of approval suspension.



FLORIDA BUILDING CODE

2nd DRAFT

COPYRIGHT® ICC 2007