

TESTING APPLICATION STANDARD (TAS) 141-95
STANDARD REQUIREMENTS FOR COAL TAR (CUTBACK)
ROOF COATING, BRUSHING CONSISTENCY

1. Scope:

- 1.1 This Protocol covers a coal tar base roof coating containing mineral filler or stabilizer and volatile solvent, suitable for brush application.
- 1.2 The property requirements used to characterize this product are minimum performance values intended to ensure that the product is fit for its intended use.
- 1.3 This Protocol specifically addresses laboratory testing of these coatings and does not provide guidance for actual field application.
- 1.4 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 2196 Standard Test Methods for Rheological Properties of Non-Newtonian Material by Rotational (Brookfield) Viscometer
- D 4990 Specification for Coal Tar Glass Felts Used in Roofing and Waterproofing
- E 380 Use of the International System of Units (SI) (The Modernized Metric System)

2.2 *The Florida Building Code, Building*

2.3 *Roof Consultants Institute*
Glossary of Terms

2. Referenced Documents:

- 2.1 *ASTM Standards*
 - D 16 Terminology Relating to Paint, Varnish, Lacquer and Related Products
 - D 93 Flash Point by Fensky-Martens Closed Tester
 - D 95 Test Methods for Water in Petroleum Products and Bituminous Materials by Distillation
 - D 140 Standard Practice for Sampling Bituminous Materials
 - D 482 Ash from Petroleum Products
 - D 562 Standard Test Method for Consistency of Paints Using the Stormer Viscometer
 - D 1079 Definition of Terms Relating to Roofing, Waterproofing, and Bituminous Materials

3. Terminology & 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. The 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. Limitations and Precautions:

- 4.1 This 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 whomever uses this Protocol to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

5. Materials and Manufacture:

- 5.1 Coal tar coating shall consist of refined coke oven tar, plasticizing oils, and aromatic and/or aliphatic tar solvents

blended with mineral and/or other stabilizers excluding asbestos, to yield a heavy brushing consistency ready for use from the storage container.

- 5.2 *Composition* - The coal tar base roof coating product shall conform to composition requirements as follows:

Component Property	Reference Section	Requirements
Non-Volatile Material	See Section 7.1	min. 60%
Ash Content	See Section 7.2	min. 5%
Water Content	See Section 7.3	max. 3%

6. Performance Requirements:

6.1 Condition in Container

6.1.1 The material shall be a smooth, homogenous mixture, after stirring, and shall be ready for use without heating or thinning. Settling in the container shall not occur to the extent that a hard cake which cannot be redispersed by hand mixing forms at the bottom of the container at 60°F (15.5°C) or above.

- 6.2 *Physical Properties* - The coal tar base roof coating product shall conform to physical property requirements as follows.

Physical Property	Referenced Standard	Requirement
Viscosity	See Section 7.5	min. 6 max. 16
Flashpoint	See Section 7.6	min. 170°F (74.6°C)
Accelerated Weathering	See Section 7.8.1	no more than hairline surface cracks and no loss of adhesion
Low Temperature Flexibility	See Section 7.8.2	no more than hairline surface cracks and no loss of adhesion

- 6.3 *Coating* - Coating shall be of a heavy brushing consistency to insure a film thickness of approximately $\frac{1}{32}$ in. (0.79 mm) at material temperature up to 90°F

(32.2°C), and yet not as stiff at 60°F (15.5°C) to prevent easy application with a suitable brush at the rate of approximately 1 gallon per 50 square feet over bituminous roofing, when tested in accordance with Section 7.4, herein.

- 6.4 *Penetration and Saturation* - The coating shall penetrate and stain at least the top 12 blotter sheets in the stack, and at least the top 9 blotter sheets shall show saturation a minimum of 95% of the total surface area of each sheet. The twelfth blotter sheet from the top shall show a stain area of at least 2 inches in diameter, when tested in accordance with Section 7.7, herein.

- 6.4 *Shelf Storage Life* - When stored as specified in Section 7.9 of this Protocol, the coating shall conform to Sections 5.1, and 6.1.1. However, the viscosity may vary $\pm 10\%$ from the values specified above.

7. Test Methods:

- 7.1 *Nonvolatile Matter* - Weigh approximately 10 grams (g) of the sample into a tarred, flat bottom metal dish about 3.15 inches (8 cm) in diameter, or into a quart friction top can plug. Heat the dish with its contents in a forced draft circulating oven at $325^\circ \pm 2^\circ\text{F}$ ($162.8^\circ \pm 1.1^\circ\text{C}$) for five hours. Cool and weigh. From the weight of the residue in the dish and from the weight of the original sample taken, compute the percentage of nonvolatile matter.

- 7.2 *Ash Content* - Scrape from the metal dish in Section 7.1 herein a large portion of the residue nonvolatile matter into a previously fired and tarred crucible. Weigh the sample. Slowly burn off the combustible matter and ignite to constant weight. Cool and weigh. Calculate the percentage of ash based on the original sample as in Specification D 482.

- 7.3 *Water Content* - Determine water content in accordance with Specification D 93.

- 7.4 *Coating* - Prepare an area 50 in. x 36 in. (1270 mm x 914.4 mm) of roofing felt conforming to Specification D 4990, firmly fastened and in a horizontal position. Apply to this specimen one quart of the coating material at a temperature of $77^\circ\text{F} \pm 2^\circ\text{F}$ ($25^\circ\text{C} \pm 1.1^\circ\text{C}$). Spread the

coating over the surface, using a suitable brush which has been saturated with the coating material. (See Section 6.3, herein.)

7.5 *Viscosity* - Determine the viscosity of the coating on a model HBT 200 or equivalent Brookfield Viscometer using a #3 Spindle at 2.5 RPM at 77°F ± 2°F (25°C ± 1.1°C). Read values on the 0-100 scale. The sample tested should be contained in a one pint can.

7.6 *Flashpoint* - Determine flashpoint in accordance with Specification D 93 using the procedure for determination of flashpoint of suspension of solids.

7.7 *Penetration and Saturation* - Place a metal ring $2\frac{7}{8}$ in. (66 mm) in diameter and $\frac{1}{2}$ in. (13 mm) high on top of a stack of 20 sheets of 4 in. x 4 in. white blotter paper. (Blotter specifications: white, uncoated 200M/1000 sheets). Stir the coating until homogeneous, and fill the ring level full with the coating. Place the ring-paper coating assembly in a forced draft circulating oven for 24 hours at 158°F ± 2°F (70°C ± 1.1°C). Remove the assembly from the oven, and cool to room temperature of 77°F ± 2°F (25°C ± 1.1°C). Carefully remove the ring from the assembly by running a thin blade knife around the inside of the ring separating the coating from the ring. Examine the blotter paper stack for depth of penetration of coating and saturation of sheets (See Section 6.4, herein).

7.8 Behavior at Warm and Cold Temperature

7.8.1 *Accelerated Aging* - Prepare a stack of 20 pieces of 40 Whatman filter paper, 0.28 in. (7.1 mm) in diameter. Place the stack of filter papers on one sheet of 4 in. x 4 in. blotter paper. Place a ring as in Section 7.7 on top of the stack, and fill level full with a sample of thoroughly mixed coating. Age the test assembly in a forced-draft circulation oven at 158°F ± 2°F (70°C ± 1.1°C) for seven days. Remove the test assembly from the oven and cool to room temperature of 77°F ± 2°F (25°C ± 1.1°C).

As in Section 7.7 remove the ring from the assembly. Bend the specimen over $\frac{1}{4}$ in. (6 mm) mandrel in not more than two seconds. Examine for cracking, loss of adhesion, embrittlement.

7.8.2 *Low Temperature Flexibility* - After recording data for Section 7.7, place the paper coating assembly into a cold box at 32°F ± 2°F (0°C ± 1.1°C) for six hours. Remove the assembly from the cold box and immediately bend over a 1 in. (25 mm) mandrel within two seconds. Not more than five seconds should elapse between removal of specimen from cold box and bending of specimen.

7.9 *Shelf Storage Life* - One container of coating shall be stored for 18 months from the date of manufacture at 77°F ± 2°F (25°C ± 1.1°C) and a relative humidity of 50% ± 5% and then shall be tested to determine compliance with the requirements of Section 6.4, herein.

8. Sampling:

8.1 Sample the material from the original container immediately after stirring to a uniform consistency, in accordance with Practice D 140.

8.2 Restir samples to obtain uniformity immediately before withdrawing portions for individual tests.

9. Packaged Material:

9.1 Packaged material shall be certified by the manufacturer to be in compliance with this specification 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 Authority Having Jurisdiction may periodically purchase commercial quantities of the approved product for testing at Approved Testing Agencies to confirm compliance with the provisions of this Protocol. Failure to meet the minimum requirements set forth in Sections 5 and 6 shall constitute grounds for rejection of the lots and suspension of the Product Approval. In cases of rejection the Authority Having Jurisdiction shall request removal of the rejected lot number(s) from commercial sale.

10.2 The Authority Having Jurisdiction may, after rejection of one or more lots, require third party quality control inspection as a provision to lifting of Approval suspension.

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