UL 55A

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Materials for Built-Up Roof Coverings

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UL Standard for Safety for Materials for Built-Up Roof Coverings, UL 55A

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Summary of Topics

This new edition of UL 55A is being issued to include requirements proposed in UL's August 19, 2004 bulletin relating to removal of references to asbestos.

The revised requirements are substantially in accordance with UL's Bulletin(s) on this subject dated August 19, 2004. The bulletin(s) is now obsolete and may be discarded.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: http://ulstandardsinfonet.ul.com/ulforeword.html

The master for this Standard at UL's Northbrook Office is the official document insofar as it relates to a UL service and the compliance of a product with respect to the requirements for that product and service, or if there are questions regarding the accuracy of this Standard.

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The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a ″SUPERSEDED REQUIREMENTS″ notice.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Listing and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

This Standard consists of pages dated as shown in the following checklist:

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An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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INTRODUCTION

1 Scope

1.1 These requirements cover the following materials for use in the construction of built-up roof coverings:

a) Hot-Mopping Asphalt – For use in the construction of coverings having either no surfacing or utilizing surfacings of cold-application roof coating on inclines not exceeding 12 inches (305 mm) to the horizontal foot, and for use in the construction of coverings surfaced with gravel, crushed stone, or crushed slag, on inclines not exceeding 3 inches (76 mm) to the horizontal foot.

b) Asphalt-Saturated Organic Felt – Type 15 (plain or perforated) and Types 20 and 30 (plain), including cap and base sheets.

c) Coal-Tar Pitch – For use in the construction of coverings surfaced with gravel, crushed stone, or crushed slag, on inclines not exceeding 3 inches (76 mm) to the horizontal foot.

d) Coal-Tar Saturated Organic Felt – Type 15.

e) Asphalt-Coated Glass-Fiber Mat (Felt) – Type G1 (ply sheets), Type G2 (cap and base sheets), and Type G3 (granular-surfaced cap sheets).

2 Glossary

2.1 For the purposes of this standard, the following definitions apply.

2.2 FELT, ORGANIC – Felt produced by the felting of organic fibers.

2.3 MAT (FELT), GLASS FIBER – A thin, porous sheet formed of randomly distributed glass fibers bonded with a water-resistant, nonbituminous binder.

2.4 SATURATED FELT – A single thickness of roofing felt saturated with an asphaltic or refined coal-tar compound.

3 General

3.1 Units of measurement

3.1.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

3.2 Undated references

3.2.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

MATERIAL

4 Hot-Mopping Asphalt

4.1 Asphalt shall be free from water.

4.2 Freshly-melted asphalt shall be homogeneous. The surface of the melted asphalt shall not become visibly dull due to the separation of oil, grease, paraffin, scale, or similar materials after 1 week of aging at room temperature.

4.3 Asphalt shall have a softening point of not less than 135°F (57°C) and not more than 225°F (107°C). See Softening Point Tests, Section 13.

4.4 Asphalt shall have a flash point of not less than:

a) 437°F (225°C) as determined by Method I; or

b) 410°F (210°C) as determined by Method II of the Flash Point Tests, Section 14.

5 Coal-Tar Pitch

5.1 Coal-tar pitch shall be free from water.

5.2 Freshly-melted coal-tar pitch shall be homogenous, having a glossy black color. The surface of the melted coal-tar pitch shall not become visibly dull due to the separation of oily constituents after 1 week of aging at room temperature. Freshly-fractured material shall have a satiny black surface.

5.3 Coal-tar pitch shall have a softening point of not less than 130°F (54°C) and not greater than 155°F (68°C), as determined by the Softening Point Test, Section 13.

5.4 Coal-tar pitch shall have a flash point of not less than:

a) 248°F (120°C) as determined by Method I; or

b) 241°F (116°C) as determined by Method II of the Flash Point Tests, Section 14.

6 Felt

6.1 Organic felt

6.1.1 Organic felt shall be uniformly smooth and, upon splitting or tearing on the bias, shall be sufficiently free from knots or lumps of stock that have not been beaten or shredded into fiber in the process of manufacture to permit obtaining the required saturation of the felt (see 8.1.1 – 8.1.3). It shall also be sufficiently free from coarse sawdust, shives, and foreign substances, such as fragments of stone, metal, leather, and rubber.

6.1.2 The weight of moisture-free organic felt (desaturated when determined from a sample of the finished product) shall be not less than:

a) 5.2 pounds per 100 square feet (0.253 kg/m^2) for Type 15 felt;

b) 6.8 pounds per 100 square feet (0.331 kg/m^2) for Type 20 felt; and

c) 10.0 pounds per 100 square feet (0.488 kg/m^2) for Type 30 felt. See 15.1.1 – 15.1.3.

6.1.3 The weight of ash from organic felt shall be not more than 10 percent of the weight of the moisture-free felt as determined by the Percent of Ash in Felt Test, Section 16.

6.2 Glass-fiber mat (felt)

6.2.1 Mat shall be:

a) Uniformly thick;

b) Free of delaminations, tuftings, oil, and grease; and

c) Sufficiently free of wrinkles, torn edges, tears, and lumps to permit uniform coating of the mat (see 9.1).

6.2.2 For the purposes of the requirement of 6.2.1:

a) Delamination is the separation of the top and bottom strata of mat.

b) Tufting is the breaking loose of the upper strata of mat so as to protrude as a flare.

6.2.3 The weight of moisture-free mat (desaturated when determined from a sample of the finished product) shall be not less than 1.0 pound per 100 square feet (0.108 kg/m^2). See 15.2.1 – 15.2.3.

6.2.4 The weight of ash from mat shall be not less than 70 percent of the weight of the moisture-free mat after being heated to 1000 ±25°F (538 ±14°C).

7 Saturants and Coatings

7.1 Asphalt

7.1.1 An asphalt saturant or coating shall comply with the requirement of 4.4.

7.2 Coal-tar pitch

7.2.1 Coal-tar saturant shall have a flash point of not less than:

a) 159°F (71°C) as determined by Method I; or

b) 150°F (66°C) as determined by Method II of the Flash Point Tests, Section 14.

8 Saturated Felt

8.1 Organic felt

8.1.1 The saturation of organic felt shall be thorough and uniform and the felt shall show no unsaturated spots at any point when 2-inch (51-mm) strips are torn at random on the bias across the entire sheet.

8.1.2 The weight of the asphalt saturant introduced into organic felt shall be not less than 1.2 times the weight of the moisture-free felt in the same respective area for Type 15 or 20 felt and not less than 1.5 times for Type 30 felt. The weight of the coal-tar saturant introduced into organic felt shall be not less than 1.4 times the weight of the moisture-free felt in the same respective area. See 15.3.1 – 15.3.3.

8.1.3 The saturation efficiency of the organic felt shall be not less than 70 percent for Type 15 or 20 asphalt saturated felts. See 15.6.1 – 15.6.3.

8.1.4 The variation in width from the nominal value specified by the manufacturer shall not exceed ±1/4 inch (±6.4 mm).

9 Asphalt Coated Glass-Fiber Mat

9.1 The individual fibers of coated mat shall be uniformly coated with the asphalt and, if necessary to comply with the requirement of 10.2, the mat shall be surfaced with a parting agent. Type G1 coated mat may contain pinholes not larger than 1/16 inch (1.6 mm) in diameter. Type G2 coated mat may contain pinholes no larger than 1/16 inch (1.6 mm) in diameter, but in no case shall there be more than four such holes in each square yard (0.84 m^2). Type G3 coated mat shall have no pinholes.

Exception: Type G1 coated mat may contain holes larger than 1/16 inch in diameter, if no hole is larger than 1/4 inch (6.4 mm) in diameter and not more than one such hole occurs in each square yard (0.84 m^2).

9.2 The weight of the asphalt coating (see 15.4.1) shall be:

a) For Type G1 – Not less than 4.5 pounds per 100 square feet (0.226 kg/m^2).

b) For Type G2 – Not less than 9.0 pounds per 100 square feet (0.430 kg/m^2) when surfaced with mica, talc, or sand.

c) For Type G3 – Not less than 15.0 pounds per 100 square feet (0.731 kg/m^2) when surfaced with mineral granules.

9.3 Coated mat shall comply with the requirement of 8.1.4.

FINISHED PRODUCTS

10 All Products

10.1 A finished product shall be sufficiently free from visible external defects, such as loose yarns or fibers, ragged or untrue edges, tears, cracks, creases, protuberances, and indentations to perform acceptably in the intended end-use.

10.2 A roll shall not crack or be sufficiently sticky to cause tearing or other damage to the material when unrolled at a temperature in the range of 50 to 140°F (10 to 60°C).

10.3 A finished product shall not crack when subjected to the Bending Test, Section 17.

11 Saturated Felt

11.1 General

11.1.1 The weight of an individual roll of asphalt-saturated organic felt (exclusive of wrapping and packing) shall be:

a) For Type 15 – Not less than 12.3 pounds per 100 square feet (0.60 kg/m^2).

b) For Type 20 – Not less than 16 pounds per 100 square feet (0.78 kg/m^2).

c) For Type 30 – Not less than 26 pounds per 100 square feet (1.27 kg/m^2).

11.1.2 The weight of an individual roll of coal-tar saturated organic felt (exclusive of wrapping and packing) shall be not less than 13 pounds per 100 square feet (0.634 kg/m^2).

11.2 Asphalt-saturated felt

11.2.1 General

11.2.1.1 For Type 15 perforated organic felt, holes not greater than 1/16 inch (1.6 mm) in diameter and spaced on not less than 1 inch (25.4 mm) centers in any row are acceptable. Adjacent rows may be staggered and shall be spaced not less than 1/2 inch (12.7 mm) apart.

11.2.1.2 The loss in weight (volatile matter) shall not exceed 4 percent for asphalt-saturated organic felt.

11.2.2 Cap and base sheets

11.2.2.1 Cap or base sheet may be formed from either Type 15, 20 (organic), or 30 saturated felt. The sheet shall be coated with asphalt on one or both sides, and shall be surfaced on one or both sides. Vent holes of varying diameter up to a maximum of 1 inch (25 mm) and having a specific spacing pattern are acceptable in Type 15 or Type 30 organic-felt sheet provided that the completed covering is acceptable when tested in accordance with the applicable requirements in the Standard for Tests for Fire Resistance of Roof Covering Materials, UL 790.

11.2.2.2 Cap or base sheet shall not flow, sag, blister, or absorb the surface coating, and mineral surfacing shall not slide more than 1/16 inch (1.6 mm), when tested in accordance with the Heating Test, Section 18.

12 Coated Mat

12.1 Type G1 coated mat shall be covered with sufficient comminuted surfacing to reduce the likelihood of sticking in the roll. The amount of the surfacing shall not interfere with adhesion between the coated sheet and the hot-mopping asphalt used to adhere sheets together.

12.2 Type G2 coated mat may be coated on one or both sides. The surface to be exposed to the weather shall be covered with talc, mica, or sand. Selvage edges and the reverse side of the sheet shall be covered with sufficient comminuted surfacing to reduce the likelihood of sticking in the roll. Specific-purpose base sheets may provide kraft paper on the back side.

12.3 Type G3 coated mat shall be coated on both sides. The surface to be exposed to the weather shall be covered with mineral granules. Selvage edges and the reverse side of the sheet shall be covered with sufficient comminuted surfacing to reduce the likelihood of sticking in the roll.

12.4 Vent holes of varying diameter up to a maximum of 1 inch and having a specific spacing pattern are acceptable in Type G1 or G2 coated mat provided that the completed covering is acceptable when tested in accordance with the applicable requirements in the Standard for Tests for Fire Resistance of Roof Covering Materials, UL 790.

12.5 The weight of an individual roll of the finished product, exclusive of wrapping and packing, shall be:

a) For Type G1 – Not less than 6.2 pounds per 100 square feet (0.301 kg/m^2).

b) For Type G2 – Not less than 12.8 pounds per 100 square feet (0.624 kg/m^2).

c) For Type G3 – Not less than 63.2 pounds per 100 square feet (6.80 kg/m^2).

12.6 The surface coating of Type G2 coated mat shall not flow, sag, blister, or be absorbed, and mineral surfacing shall not slide more than 1/16 inch (1.6 mm) when tested in accordance with the Heating Test, Section 18.

TEST METHODS

13 Softening Point Tests

13.1 Asphalt test

13.1.1 The softening point of asphalt is to be determined in accordance with the Standard Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus), ASTM D36.

13.2 Coal-tar pitch test

13.2.1 The softening point of coal-tar pitch is to be determined in accordance with the Standard Test Method for Softening Point of Pitches (Cube-in-Water Method), ASTM D61.

14 Flash Point Tests

14.1 General

14.1.1 A representative sample of the material, without stabilizer, is to be tested by one of the two methods specified in 14.2.1 and 14.3.1.

14.1.2 The sample is to be obtained at the saturating machine from the pipelines leading to the machine. Care is to be taken to avoid including sediment at the bottom or froth at the top of tanks or vats.

14.2 Method I

14.2.1 The flash point is to be determined in accordance with the Standard Test Method for Flash and Fire Points by Cleveland Open Cup, ASTM D92.

14.3 Method II

14.3.1 The flash-point is to be determined in accordance with the Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester, ASTM D93.

15 Weight Tests

15.1 Weight of felt test

15.1.1 An undamaged sample of dry felt is to be obtained from stock ready to be used on the saturating machine. A section measuring 30 inches (762 mm) in the direction of the roll's length is to be removed and three 1 by 1 foot (305 by 305 mm) samples are to be taken, one near each side and one from the center of the sheet.

15.1.2 Each sample is to be maintained for 30 minutes at 215 – 225°F (102 – 107°C) in an oven having a free circulation of air. The samples then are to be removed from the oven and weighed immediately, to prevent reabsorption of moisture, and the weight of the felt in pounds per 100 square feet ($kg/m^2 \times 20.5$) calculated, using the following formula:

$$W = 0.0734P$$

In which:

W is the weight in pounds per 100 square feet, and

P is the weight in grams of the three specimens.

15.1.3 As an alternative, the weight of felt may be determined from the finished product. See 15.5.1 – 15.5.4.

15.2 Weight of glass mat test

15.2.1 Samples of dry glass mat are to be obtained from a roll. After unwinding sufficient convolutions to obtain undamaged mat, a 15-foot (4.6-mm) length is to be removed and ten 1 by 1 foot (305 by 305 mm) specimens are to be cut at random, taking care not to cut a specimen within 2 inches (51 mm) of either edge of the trimmed mat.

15.2.2 Each specimen is to be weighed to the nearest one-hundredth of a gram and the weight of the mat in pounds per 100 square feet ($kg/m^2 \times 20.5$) is to be calculated, using the following formula:

$$W = 0.0220P$$

In which:

W is the weight in pounds per 100 square feet, and

P is the weight in grams of the ten specimens.

15.2.3 As an alternate, the weight of the mat may be determined from the finished product. See 15.5.1 – 15.5.4.

15.3 Percent saturation of felt test

15.3.1 Adjacent sections (in the direction of the roll's length) of unsaturated and saturated felt are to be cut from the felt in the saturating machine. Specimens then are to be cut to an area of exactly 32 square inches (206 cm^2) and no dimension is to be less than 2 inches (51 mm). Specimens are to be cut no closer than 1 inch (25.4 mm) from the edge of the sheet. In order to obtain accuracy and reproducibility of results, a die is to be employed to cut the specimens used in this test.

15.3.2 The samples are to be weighed, and the weight of the saturant calculated as follows: