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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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# Standard Specification for Prefabricated Asphalt Reservoir, Pond, Canal, and Ditch Liner (Exposed Type)[1]

This standard is issued under the fixed designation D 2643; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers prefabricated asphalt liner sheets intended for installation in accordance with Practice D 3745 to provide a continuous, exposed lining for reservoirs, ponds, canals, and ditches.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 The following precautionary caveat pertains only to the test method portion, Section 8, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

2.1 *ASTM Standards:*

D 994 Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)[2]

D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials[3]

D 2172 Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures[2]

D 3745 Practice for Installation of Prefabricated Asphalt Reservoir, Pond, Canal, and Ditch Liner (Exposed Type)[3]

E 154 Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, and as Ground Cover[4]

## 3. Terminology

3.1 *Definitions*—Refer to Terminology D 1079 for definitions of terms used in this specification.

## 4. Materials and Manufacture

4.1 The liner sheets shall consist of layers of asphalt mastic between asphalt-saturated felts, mats, or fabrics, and shall be coated on both sides and covered with a material to prevent the finished sheets from sticking together during storage and shipment.

4.2 The mastic shall consist of asphalt, mineral fillers, and reinforcing fibers of any type.

4.3 The felts, mats, or fabrics shall be organic or glass fiber, and shall be impregnated with a hot asphaltic saturant.

4.4 The coating shall be a hot-applied asphalt material permitted to be compounded with a mineral stabilizer.

4.5 The material or treatment applied to prevent the finished sheets from sticking together shall be such that it can be removed at the installation site, or its presence will not interfere with bonding of joint sealant.

## 5. Physical Requirements

5.1 The liner sheets shall conform to the requirements prescribed in Table 1.

## 6. Dimensions, Mass, and Permissible Variations

6.1 *Dimensions:*

6.1.1 *Thickness*—0.500± 0.060 in. (12.70 ± 1.60 mm).

6.1.2 *Width*—36 or 48± ¼ in. (915 or 1220 ± 7 mm).

6.1.3 *Length*—96, 120, or 144 ± ½ in. (2440, 3050, or 3660 ± 15 mm).

6.1.4 Other dimensions may be agreed upon between the purchaser and the supplier for liner sheets and batten or cover strips as part of the purchase contract.

6.2 *Density*—72 lb/ft$^3$ (1150 kg/m$^3$) minimum at 77°F (25°C).

6.3 *Thickness of Asphalt Coating*—0.023 ± 0.008 in. (0.60± 0.20 mm).

NOTE 1—If glass mat or fabric is used for the facings, the asphalt coating thickness can not readily be determined and this requirement shall be waived.

## 7. Workmanship, Finish, and Appearance

7.1 Both surfaces of the liner sheets shall be uniform in finish and texture. The asphaltic coating shall be applied uniformly to each side over the entire area and up to the edges of the sheet, and the material or treatment to prevent sticking shall be applied uniformly.

7.2 Upon cutting the liner sheets at any point and examining the cross section, there shall be no voids in the mastic or

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[2] *Annual Book of ASTM Standards*, Vol 04.03.

[3] *Annual Book of ASTM Standards*, Vol 04.04.

[4] *Annual Book of ASTM Standards*, Vol 04.07.

**TABLE 1 Physical Requirements of Asphalt Liner Sheets**

| | |
|---|---|
| Water absorption, max, % | 1.0 |
| Mass percent of asphalt, min, % | 65.0 |
| Resistance to decay | no effect |
| Flexibility | no cracking or rupture |
| Brittleness | no cracking or shattering |
| Heat distortion | no bulging or mastic flow |

unsaturated spots in the felts, mats, or fabrics.

7.3 The liner sheets shall be free of visible defects such as holes, ragged or untrue edges, breaks, cracks, protuberances, and indentations.

## 8. Sampling and Test Methods

8.1 *Sampling*—Select one sheet at random from every 400 sheets or fraction thereof.

8.2 *Thickness*—Cut one test specimen 2 by 6 in. (50 by 150 mm) from each liner sheet in the sample as shown at A-1 in Fig. 1. Measure the thickness to the nearest 0.001 in. (0.02 mm) at four points about ½ in. (13 mm) in from the center of each edge; average the measurements and record as the thickness.

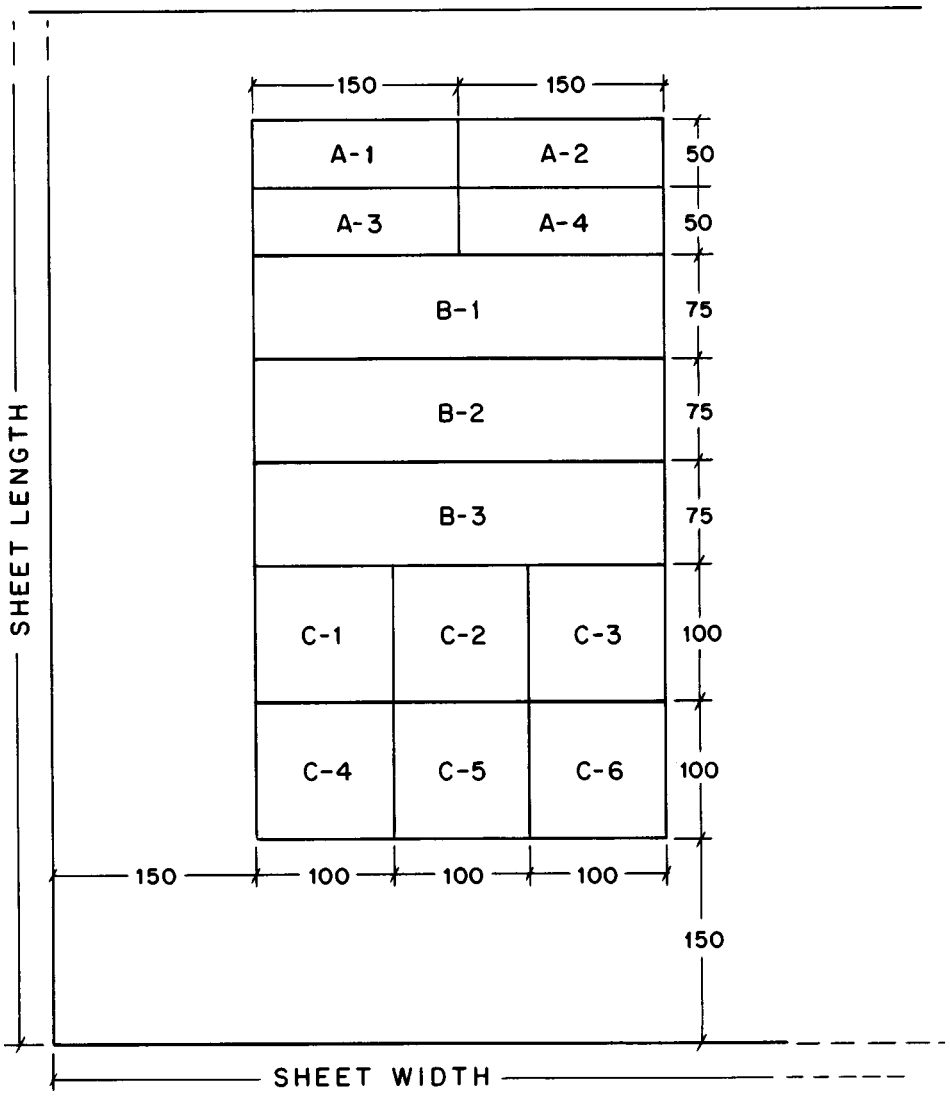
8.3 *Thickness of Asphalt Coating*:

8.3.1 Using a heated putty knife or other blade, carefully remove the asphalt coating from one side of the specimen from 8.2 in the four areas where the thickness measurements were made.

8.3.2 After cooling, measure the thickness again at the same four points. Record the difference of the average thicknesses determined in 8.2 and 8.3.2 as the average thickness of the coating on that side.

8.3.3 Repeat the procedure for the other side of the specimen, but record the difference of the average thicknesses determined in 8.3.2 and 8.3.3 as the average thickness of the coating on the second side.

8.4 *Water Absorption*—Cut two test specimens 2 by 6 in. (50 by 150 mm) from each sheet in the sample as shown at A-2




All dimensions in millimetres.

**FIG. 1 Location of Test Specimens in Each Sample Sheet**

and A-3 in Fig. 1. Test each specimen in accordance with 7.3 of Specification D 994.

8.5 *Mass Percent of Asphalt*—Cut one test specimen 2 by 6 in. (50 by 150 mm) from each sheet in the sample as shown at A-4 in Fig. 1. Test in accordance with Test Methods D 2172, Method B. For referee testing, use Test Methods D 2172.

8.6 *Resistance to Decay*—Cut four test specimens 4 by 4 in. (100 by 100 mm) from each sheet in the sample as shown at C-1, C-2, C-3, and C-4 in Fig. 1. Test in accordance with Test Methods E 154, except that the specimens shall be square. Examine for any evidence of blistering, wrinkling, swelling, or separation of layers. Retain these specimens for the brittleness test described in 8.8.

8.7 *Flexibility*:

8.7.1 Cut three test specimens 3 by 12 in. (75 by 300 mm) from each sheet in the sample as shown at B-1, B-2, and B-3 in Fig. 1. Condition for 2 h at 90 ± 5°F (32 ± 3°C).

8.7.2 Use a short length of 460-mm outside diameter pipe (18-in. NPS) as a horizontal mandrel. Lay the test specimen across the top of the mandrel at right angles to its axis. Then slowly bend the specimen around the mandrel by pressing both ends downward at a uniform speed so that complete contact is made with the surface of the cylinder in 60 ± 10 s.

8.7.3 Examine the specimen for any evidence of cracking or rupture.

8.8 *Brittleness*:

8.8.1 Cut one test specimen 4 by 4 in. (100 by 100 mm) from each sheet in the sample as shown at C-5 in Fig. 1. Condition for 2 h at 39 ± 3°F (4 ± 2°C).

8.8.2 Place the specimen in the center of a 200-mm (8-in.) square piece of ¾-in. (19-mm) thick plywood, resting on a horizontal concrete surface. Subject the center of the specimen to one impact from a 1.0-lb (0.45-kg) iron ball dropped a distance of 36 in. (915 mm).

8.8.3 Condition the three specimens from 8.6 and subject them to the impact described in 8.8.2.

8.8.4 Examine each specimen for evidence of any cracking or shattering.

8.9 *Heat Distortion*:

8.9.1 Cut one test specimen 4 by 4 in. (100 by 100 mm) from each sheet in the sample as shown at C-6 in Fig. 1.

8.9.2 Condition the specimen on a horizontal steel surface for 2 h at 150 ± 3°F (66 ± 2°C).

8.9.3 Examine the specimen for any evidence of bulging or flow of the mastic core.

## 9. Inspection

9.1 *Inspection*—Inspection shall be in accordance with the requirements of this specification.

9.2 *Inspection Alternatives*—Alternative inspection requirements shall be determined by and as agreed upon between the purchaser and the supplier.

## 10. Rejection and Resubmittal

10.1 *Failure to Conform*—Failure to conform to any of the requirements as stated in this specification constitutes grounds for rejection.

10.2 *Rejection Redress*—The supplier shall have the right to inspect the rejected materials. The supplier and the purchaser shall agree to the quantity of rolls deemed unacceptable. The supplier shall then have the right to submit the same number of new rolls as replacement.

## 11. Packaging and Package Marking

11.1 Unless otherwise agreed upon between the supplier and purchaser, each product package shall be plainly marked with the supplier's name, the product brand, the ASTM designation, and type of bitumen if not evident in the label name of the product.

## 12. Keywords

12.1 exposed lining; ponds; canals; and ditches; prefabricated asphalt liner sheets; reservoirs