

MIL-A-3029**23 AUGUST 1949****SUPERSEDING**

Army 8-160

23 September 1948

MILITARY SPECIFICATION**ASPHALT, WATERPROOFING****(For Use in Manufacture of Fiber Ammunition Containers)**

This specification was approved by the Departments of the Army, the Navy, and the Air Force for use of procurement services of the respective Departments.

1. SCOPE AND CLASSIFICATION

1.1 This specification covers one type of asphalt suitable for use in the manufacture of fiber containers for packing of ammunition.

2. APPLICABLE SPECIFICATIONS

2.1 The following specifications, of the issue in effect on the date of invitation for bids, form a part of this specification:

FEDERAL SPECIFICATIONS

SS-B-406—Road and Paving-Materials; General Specifications (Methods of Sampling and Testing).

VV-L-791—Lubricants, Liquid Fuels, and Related Products; Methods of Sampling and Testing.

U. S. ARMY SPECIFICATION

100-2—Standard Specification for Marking Shipments by Contractors.

(Army.—Copies of specifications should be obtained from the procuring agency or as directed by that agency. Both the title and identifying number or symbol should be stipulated when requesting copies.)

3. REQUIREMENTS

3.1 Material.—Material shall be prepared from asphaltic petroleum.

3.2 Appearance.—Freshly melted asphalt shall be black and glossy, and upon aging for one week, its surface shall not show any separation of oil, grease, paraffin scale or similar material. (See 4.3.1.)

3.3 Insoluble material. (See 4.3.2.)

3.3.1 In carbon disulfide, maximum, 1 percent.

3.3.2 In carbon tetrachloride, maximum, 2 percent.

3.3.3 In benzene, maximum, 2 percent.

3.4 Softening point.—The softening point shall be between 80° and 85° C. when tested as specified in 4.3.3.

3.5 Penetration.—The minimum penetration shall be 25 mm. when tested as specified in 4.3.4.

3.6 Flash point.—The minimum flash point shall be 232° C. when tested as specified in 4.3.5.

3.7 Mineral matter.—Maximum, 0.5 percent.

4. SAMPLING, INSPECTION, AND TEST PROCEDURES**4.1 Sampling.**

4.1.1 Lot.—Unless otherwise specified, a lot shall consist of not more than 10,000 pounds.

4.1.2 Sampling procedure.—Ten percent, but in no case more than 10 or less than 3, of the containers shall be selected by the Government inspector so as to be representative of the lot. When there are fewer than 3 containers in the lot, all the containers shall be sampled. For sampling the material, a clean hatchet, an auger, or a brace and a 3/4-inch bit may be used. A 12-ounce primary sample shall be taken from each container selected, at least 3 inches below the surface and not less than 3 inches from the side of the container. Each of these primary samples shall be placed in an airtight container

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and labeled so that the container from which it was taken can be identified. A composite sample of not more than 1 pound shall be made from equal portions of the primary samples. The composite sample shall be melted and thoroughly mixed at 100° C. and placed in a container labeled to show the name of the material, manufacturer, plant, contract or order number, lot number and lot size. All acceptance tests shall be made on the composite sample. Should it become apparent during sampling that the lot is not uniform, the Government inspector may require that any of the primary samples be tested for compliance with this specification. All primary samples shall be held for possible future examination should the composite sample fail to meet the requirements.

4.2 Inspection.

4.2.1 Inspection shall be at the point of delivery unless otherwise specified in the contract or order.

4.2.2 The Government inspector will inspect the material to determine compliance with those requirements of the specification for which no tests are specified in 4.3.

4.3 Tests.—Tests shall be made as follows:

4.3.1 Appearance.—Carefully melt about 10 grams of the sample at a temperature not exceeding 200° C. and pour into a small tin box or other suitable container provided with a cover. At least one half of the surface shall be free from froth or bubbles. Allow the asphalt to cool in a place free from drafts and dust. When cool, examine the surface, then cover and set aside for a week. Immediately after cooling, the surface shall be glossy black, and after standing one week, there shall be no separation of paraffin or greasy or oily material.

4.3.2 Insoluble matter.—Transfer an accurately weighed sample of approximately 1 gm. to a 250-ml. beaker, cover it with 100 ml. of the required solvent (carbon tetrachloride, carbon disulfide, or benzene) at room temperature and stir until the asphalt is dissolved; set aside for 15 minutes. Filter with the aid of a tared Gooch crucible, and wash thoroughly with more of the solvent until the washings are colorless. Aspirate the crucible and contents until free of odor of the solvent, and then dry for 20 minutes

at 100 to 105° C., cool in a desiccator and weigh. Calculate the gain in weight of the crucible as percentage of matter insoluble in the solvent used.

4.3.3 Softening point.

4.3.3.1 Apparatus.—Use apparatus consisting of the following:

4.3.3.1.1 Ring.—A brass shouldered ring conforming to the dimensions shown in figure 1, item (a).

4.3.3.1.2 Ball.—A steel ball, 9.53 mm. ($\frac{3}{8}$ in.) in diameter weighing between 3.45 and 3.55 grams.

4.3.3.1.3 Ball guide.—A ball guide for centering the balls, constructed of brass and having the shape and dimensions shown in figure 1, item (c).

4.3.3.1.4 Container.—A glass vessel, capable of being heated, not less than 8.5 cm. ($3\frac{1}{8}$ in.) in diameter and not less than 10.5 cm. ($4\frac{1}{8}$ in.) in depth from the bottom of the flare. (A 600-ml. low-form beaker is convenient.)

4.3.3.1.5 Support for ring and thermometer.—Ring holder (see fig. 1, item (b) and fig. 2.) Support the ring in a substantially horizontal position. (See 4.3.3.2.)

4.3.3.1.6 Thermometer.—A high softening point thermometer graduated in centigrade degrees (16 C–39) conforming to method 950.1 of Specification VV–L–791.

4.3.3.2 Method.—Melt the sample by any convenient method, not allowing the temperature to exceed that which would be necessary to pour the material readily without inclusion of air bubbles. Do not allow the time from the beginning of heating to the pouring of the sample to exceed 15 minutes. Preheat the rings immediately before filling to approximately the temperature at which the material is to be poured. Rest the rings, while being filled on an amalgamated brass plate. Pour into the rings such a quantity of the material that after cooling 40 minutes at room temperature an excess amount will remain. Cut this excess off cleanly with a slightly heated spatula. Fill the glass container to a depth not less than 9 cm. ($3\frac{1}{2}$ in.) with U. S. P. glycerin which has been cooled to not less than 45° C. below the anticipated softening point but in no case

lower than 35° C. Suspend the ring, containing the sample and ball guide, in the glycerin so that the lower surface of the filled ring is 2.5 cm. above the upper surface of the lower horizontal plate which is at least 1.3 cm. ($\frac{1}{2}$ in.) above the bottom of the glass vessel, and so that its upper surface is at least 5.1 cm. (2 in.) below the surface of the liquid. Place the ball in the glycerin but not on the specimen. Suspend the thermometer so that the bottom of the bulb is level with the bottom of the ring and within 1.0 cm. ($\frac{3}{8}$ in.) but not touching the ring. Maintain the initial temperature for 15 minutes. With suitable forceps place the ball in the center of the upper surface of the material in the ring. Apply heat so that the temperature of the bath is raised $5^{\circ} \pm 0.5^{\circ}$ C. each minute. Reject all tests in which the rise in temperature exceeds these limits in any minute after the first 3 minutes. Adjust the rise in temperature for the first 3 minutes as close as possible to $5^{\circ} \pm 0.5^{\circ}$ C. each minute but do not allow it to exceed $5^{\circ} \pm 1^{\circ}$ C. Take the softening point as the temperature indicated by the thermometer at the instant the sample touches the lower horizontal plate. Do not correct for emergent stem of the thermometer.

4.3.4 Penetration.—Determine the penetration by method 214.0 specified in Specification SS-R-408.

4.3.5 Flash point.—Determine the flash point by method 217.0 specified in Specification SS-R-408.

4.3.6 Mineral matter.—Transfer 5 gms. of the sample to a tared porcelain crucible (Coors #1, or equal). Melt the sample with the aid of a low Bunsen burner flame. Slowly heat to the flash-point temperature. Ignite the evolved vapors with the aid of the Bunsen flame. Continue gentle heating, at a rate such that the material burns continually, but does not froth, until all the liquid matter has burned off. Transfer the crucible and contents to a muffle furnace. Ignite for 4 hours at $800^{\circ} \pm 50^{\circ}$ C., cool in a desiccator and weigh. Calculate the increase in weight of the crucible to percentage of mineral matter.

4.4 Resubmission and retests.—When the composite sample, or any primary sample, fails to pass the tests the lot shall be rejected. The contractor shall have the option of having a partial or complete analysis made on samples taken from all or any of the containers in the lot at no expense to the Government. The contractor may then remove the defective portions of the lot and resubmit the lot for acceptance, provided complete replacement of the defective portions can be made to the satisfaction of the inspector. The resubmitted lot shall be accepted, provided that new samples selected in accordance with 4.1.2 shall pass all the tests required by the specification.

5. PREPARATION FOR DELIVERY

5.1 Packing.—Unless otherwise specified, the containers of asphalt shall be packed so as to insure acceptance by common or other carriers for safe transportation at the lowest rate, to the point of delivery.

5.2 Labeling and marking.—In addition to any special marking required by the contract or order, shipments for the Army shall be marked in accordance with specification 100-2.

6. NOTES

6.1 Ordering data.—Invitations for bids and contracts or orders should specify the title, number, and date of this specification.

Notice.—When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation or conveying any rights or permission to manufacture, use, or sell any patented invention that may be in any way related thereto.

Custodian:

Army—Ordnance Department.

Other interest:

Army—EST.

Navy—OS.

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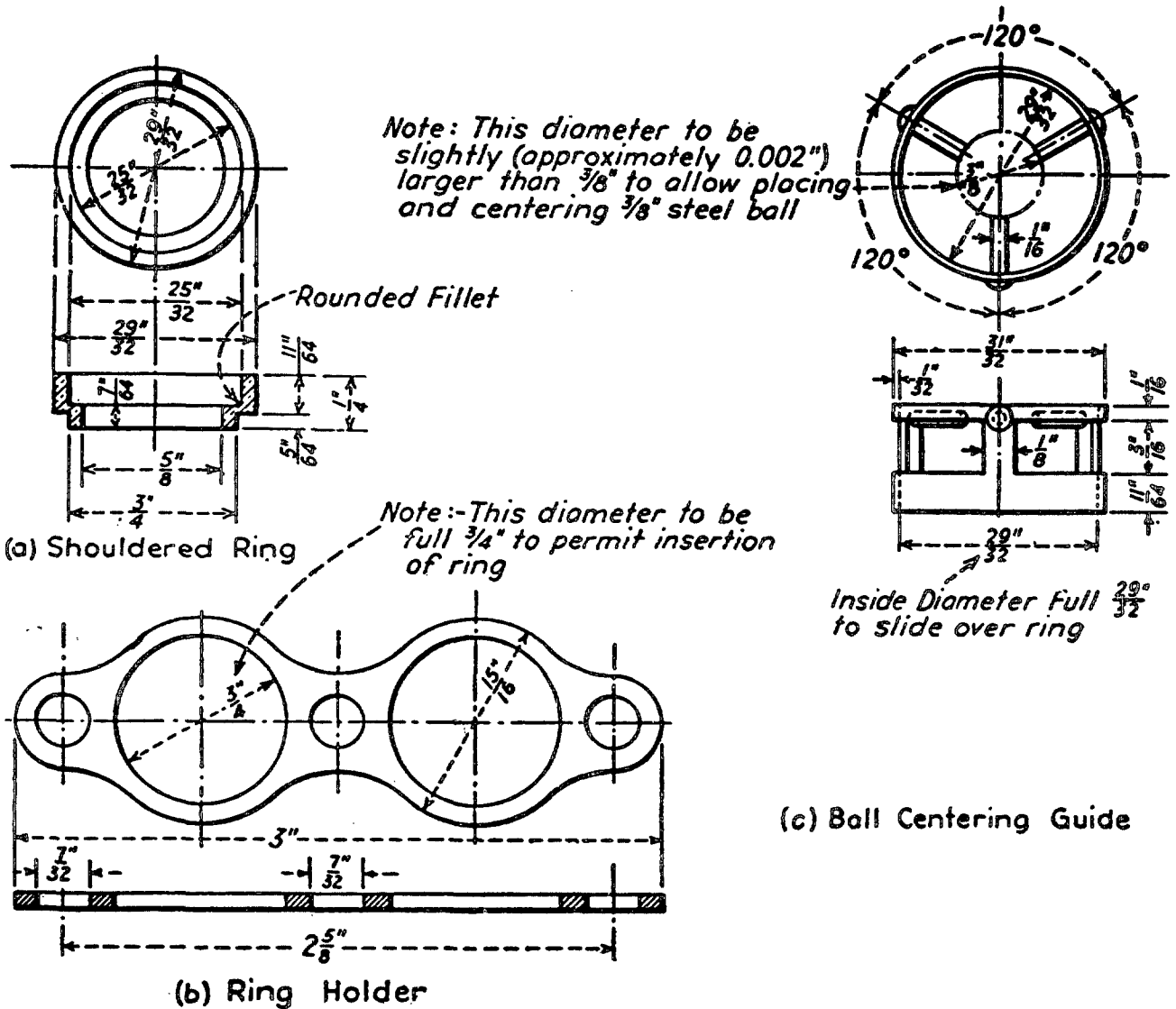


FIGURE 1.—Shouldered ring, ring holder, and ball centering guide for softening point determination.

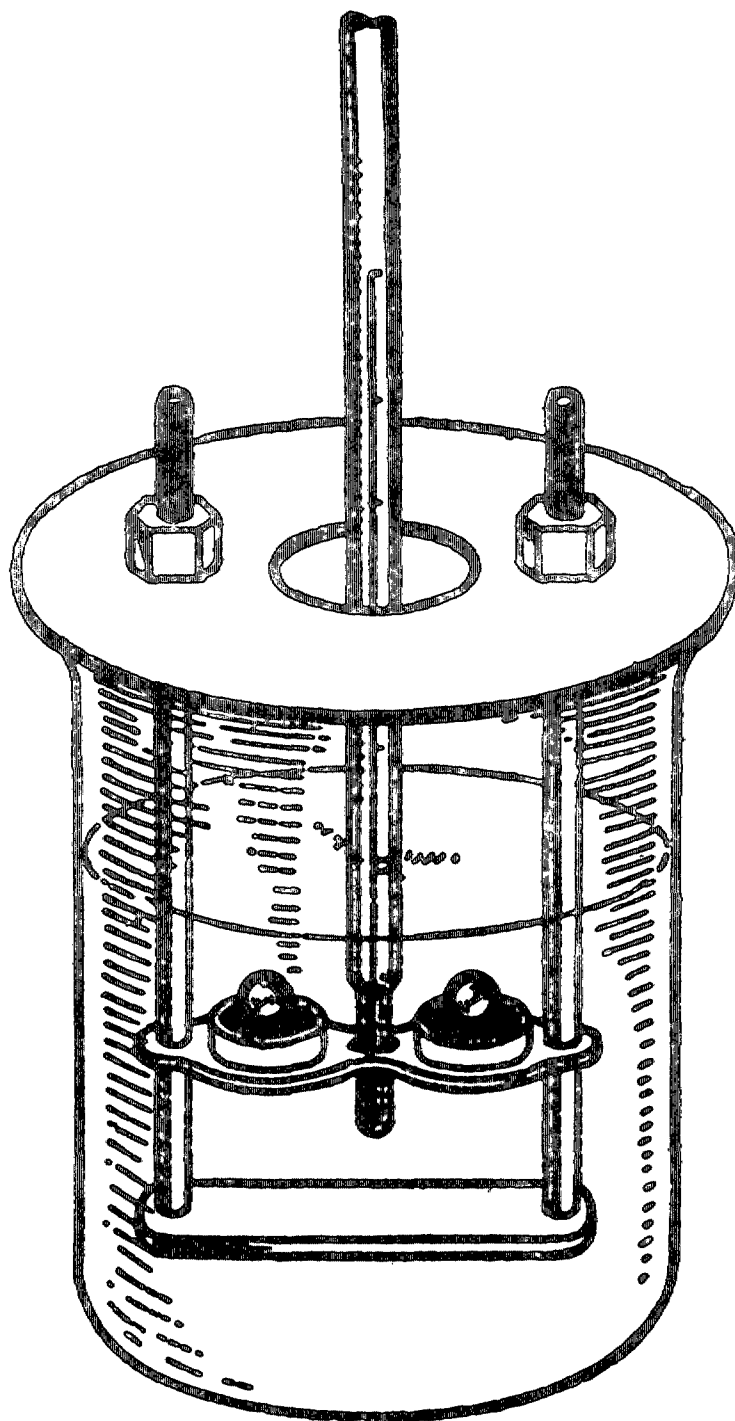


FIGURE 2.—Assembly of apparatus, showing two rings, for softening point determination.