

**ALDOT-319-82**  
**RAPID METHOD TO DETERMINE THE BITUMEN CONTENT IN**  
**BITUMINOUS PAVING MIXTURES**

**1. Scope**

- 1.1. This is a rapid test method to be used in routinely determining the bitumen content in hot mixed paving mixtures. The method described is a modification of AASHTO T-164, Method A.

**2. Apparatus**

- 2.1. Rotorex (Electric or Manual)
- 2.2. Beaker (200-500 ml capacity)
- 2.3. Pans (Approximately 18 x 12 in (450 x 300 mm))
- 2.4. Filter Rings (Appropriate size)
- 2.5. Hot Plate (Electric or Gas)
- 2.6. Balance (Conforming to the requirements of AASHTO M-231 Class G2)
- 2.7. Spatula
- 2.8. 2 in Paint Brush

**3. Reagents**

- 3.1. Trichloroethylene, Technical Grade, Type I, Federal Specification 0-T-634, latest revision.
- 3.2. 1,1,1, Trichloroethane, Conforming to Federal Specification 0-T-620, (Interim Amendment 3).

**Note 1:** The Solvents should be used only under a hood in a well ventilated area.

**4. Determination of Water in Mineral Aggregate**

- 4.1. Obtain sample and test in accordance with ALDOT-130.

**5. Procedure**

- 5.1. Secure a representative sample of the Bituminous Mixture in accordance to AASHTO T-168.
- 5.2. Quarter the sample to the size required (in AASHTO T-164, Table I) by AASHTO T-248. For samples containing aggregate greater than 1 in. (25 mm) in diameter, a sample of a least

1.5 to 2 kg. may be used. However, before any material can be rejected, the requirements for sample size shown in Table I of AASHTO T-164 must be complied with.

- 5.3. Weigh filter rings after drying to a constant weight over hot plate or heater fan. Record the mass.
- 5.4. Weigh sample and record weight.
- 5.5. Place sample in the rotor bowl, cover the sample in the bowl with solvent and allow sufficient time for the solvent to disintegrate the sample (not over one hour, usually 5 to 10 minutes).
- 5.6. Start rotorex bowl revolving slowly and gradually increase the speed to a maximum of 3600 rpm or until solvent ceases to flow from the drain. Allow the machine to stop, add 200 ml of solvent and repeat the procedure. Use sufficient 200 ml solvent additions (not less than three) so that the extract is clear and not darker than a light straw color. Collect the extracted solvent in a suitable graduate.
- 5.7. Remove bowl from rotorex. Place in pan so as no edges will protrude over side of pan. Remove funnel screw, take approximately 50 mm paintbrush and clean bowl lid. Next, brush any adhering particles of filter pad off into the pan, then remove material from the bowl into pan by using a brush.
- 5.8. Dry the sample slowly on a hot plate and agitate aggregates repeatedly with spatula until no odor from the solvent can be detected.
- 5.9. Dry filter rings until no odor can be detected. Weigh and record weight gain in the filter rings.
- 5.10. Weigh extracted aggregate and record mass.

## 6. Calculations

- 6.1. Calculate the percentage of bitumen in sample as follows:

Percent Bitumen content based on total sample

$$\frac{(W_1 - W_2) - (W_3 + W_4 + W_5)}{W_1 - W_2} \times 100$$

Where:

$W_1$  = original mass of sample

$W_2$  = mass of water in sample

$W_3$  = mass of extracted mineral matter

$W_4$  = mass of mineral matter in extract, based on ash correction factor (See Note 4 and 5)

$W_5$  = increase of mass of filter rings

**Note 3:** The ash correction factor can be obtained by placing all of the effluent from the extraction test (Article 5.5 and 5.6) in a sealed water tight container and submitting it along with the total mass of the mineral water to the Division or Central Laboratory.

**Note 4:** If the Asphalt Laboratory at the plant site is equipped to determine the ash test in accordance with AASHTO T-164, it shall be used instead of the ash correction factor.