Standard Practice for

Recovery of Asphalt Binder from Solution by Abson Method

AASHTO Designation: R 59-11 (2019)[1]

Technical Subcommittee: 2c, Asphalt–Aggregate Mixtures

Release: Group 3 (July)

ASTM Designation: D1856-09

AASHTO

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1. SCOPE

1.1. This practice covers the recovery, by the Abson Method, of asphalt binder from a previously conducted extraction with reagent-grade trichloroethylene or reagent-grade methylene chloride (Note 1). The asphalt binder is recovered with properties substantially the same as those it possessed in the asphalt mixture and in quantity sufficient for further testing.

Note 1—Trichloroethylene conforming to ASTM D4080 or technical-grade methylene chloride may be used, but it is recommended that for each new supply of the solvent a "blank" recovery as described below be performed on an asphalt binder of known properties. Certain epoxy resins in some non-reagent-grade solvents may affect the properties of the recovered binder. In case of dispute, reagent grade should be used.

1.2. *Blank Determinations*—Introduce about 75 to 100 g of asphalt binder into a 2000-mL (68-oz) flask; add about 800 mL (27 oz) of solvent to dissolve the asphalt. Allow the solution to stand for about 4 h; concentrate the solution by distillation to about 200 mL (6.8 oz), and then recover the asphalt binder. The total elapsed time, from when the solvent is added to the time the recovery test is completed, is about 7 h.

1.3. The values stated in SI units are to be regarded as the standard.

1.4. *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. *AASHTO Standards*:

- T 111, Mineral Matter or Ash in Asphalt Materials
- T 164, Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt (HMA)

2.2. *ASTM Standards*:

- C670, Standard Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
- D4080, Standard Specification for Trichloroethylene, Technical and Vapor-Degreasing Grade
- E1, Standard Specification for ASTM Liquid-in-Glass Thermometers

2.3. *Federal Standard*:

- Fed. Std. No. 29, CFR 1910.1200 OSHA Hazard Communication Standard; see also Permissible Exposure Limits—Annotated Tables, available at https://www.osha.gov/dsg/annotated-pels/

3. SUMMARY OF METHOD

3.1. The solution of solvent and asphalt binder from a prior extraction is distilled under prescribed conditions to a point where most of the solvent has been distilled, at which time carbon dioxide gas is introduced into the distillation process to remove all traces of the extraction solvent. The recovered asphalt binder (distillation residue) can then be subjected to further testing as required.

4. SIGNIFICANCE AND USE

4.1. The asphalt binder should be extracted from the asphalt mixture in accordance with Method A or E (Note 2) of T 164, as there is some experimental evidence that the recovered asphalt binder may have slightly lower penetration values when recovered from solutions obtained from hot extraction methods.

Note 2—Equipment in Method E of T 164 can be modified by a vacuum trap attached to the top of the "end-point" site tube to collect the extract.

5. APPARATUS

5.1. *Centrifuge*—Batch unit capable of exerting a minimum centrifugal force of 770 times gravity or a continuous unit capable of exerting a minimum force of 3000 times gravity.

5.2. *Centrifuge Tubes*—A supply of 250- to 500-mL (8.5- to 16.9-oz) wide-mouth bottles, or centrifuge tubes as shown in Figure 1.