

Recovering Residue from Emulsified Asphalt Using Low-Temperature Evaporative Techniques

AASHTO Designation: PP 72-11



1. SCOPE

- 1.1. This practice covers two methods for recovering the residue from emulsified asphalts such as those specified in M 140 and M 208, using low-temperature evaporative techniques that are similar to pavement conditions. The recovered residue can be used for further testing as required.
- 1.2. The values stated in SI units are to be regarded as the standard.
- 1.3. *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns 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:*
- M 140, Emulsified Asphalt
 - M 208, Cationic Emulsified Asphalt
 - T 59, Emulsified Asphalts
- 2.2. *ASTM Standard:*
- E 145, Standard Specification for Gravity-Convection and Forced-Ventilation Ovens
- 2.3. *Other Standards:*
- NF EN 13074, Recovery of Binder from Bitumen Emulsions by Evaporation
- Note 1**—The EN 13074 Standard is published and distributed through AFNOR (French Standard Institute) and is available on line at www.afnor.fr.

3. SIGNIFICANCE AND USE

- 3.1. Use the procedures described in this practice to obtain a residue from emulsified asphalt for further testing in devices such as a dynamic shear rheometer. The lower evaporative temperatures of these procedures provide conditions that are very close to that of application techniques for these materials. Use this practice in place of recovery techniques such as those in T 59; the temperatures used in that standard may negatively affect the residue.

4. APPARATUS

- 4.1. *Silicone Mat*—The mat used can be similar to that specified in NF EN 13074 or any mat that will allow an emulsified asphalt spread rate of 1.5 to 2.0 kg/m² (0.31 to 0.41 lb/ft²) for Procedure A or a 0.381-mm (0.015-in.) wet film thickness for Procedure B. The mat may have a lip to contain the emulsified asphalt in the appropriate area.
- Note 2**—A silicone mat can be purchased at restaurant supply stores. The size of the mat should be larger than the wet film applicator or other suitable sample-spreading tool. The mat size should be sufficient to produce a sample of the desired volume for subsequent testing. A good size for this application is a half-sheet pan size, which will fit in most laboratory ovens.
- 4.2. *Flat Oven Tray*—A flat oven tray or other flat heat-resistant tray or pan to support the silicone mat and allow easy transfer to the oven.
- Note 3**—A metal cookie sheet, slightly larger than the silicone mat, works well. The tray and silicone mat must fit on a rack in the forced-draft oven.
- 4.3. *Spatula*—A spatula or palette knife for spreading the emulsified asphalt.
- 4.4. *Rods*—Rounded-end glass or metal rods of sufficient diameter and length to roll up the residue sample.
- 4.5. *Forced-Draft Oven*—Horizontal air flow, mechanical convection oven meeting the requirements of ASTM E 145, Type IIA, at 25°C (77°F) and 60°C (140°F). Racks shall be spaced a minimum of 10 cm (4 in.) from the top and bottom of the oven and with a minimum spacing of 4 cm (1.6 in.) between racks with samples. Use a bubble level of 25-cm (10-in.) minimum length to ensure the racks are level from side to side and front to back in the oven in its operating location.
- Note 4**—Ambient laboratory conditions (22 to 28°C) (72 to 82°F) may be used for the 25°C (77°F) temperature curing for Procedure A if the sample is placed in a dust- or contaminant-free environment with some air flow. A laboratory hood with an operating fan is a suitable alternative.
- 4.6. *Wet Film Applicator*—A wet film applicator designated to produce a wet film thickness of 0.381 mm (0.015 in.) [a gap depth of 0.762 mm (0.030 in.)] and a width of less than the application direction of the silicone mat.
- Note 5**—Examples of applicators that work are Bird-type film applicators and 8-sided applicators.

5. PROCEDURE A

- 5.1. Pour the required amount of emulsified asphalt onto a silicone mat supported by a flat oven tray and spread it evenly with a spatula to produce a spread rate of 1.5 to 2.0 kg/m² (0.31 to 0.41 lb/ft²) of emulsified asphalt. Use Table 1 as a guide for the quantities of emulsified asphalt necessary to produce the appropriate spread rate for a given area.