



Designation: D7497 – 21

# Standard Practice for Recovering Residue from Emulsified Asphalt Using Low-Temperature Evaporative Technique<sup>1</sup>

This standard is issued under the fixed designation D7497; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice covers a method for recovering the residue from emulsified asphalts such as those specified in Specifications [D977](#) and [D2397/D2397M](#) using a low-temperature evaporative technique that is 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. The values given in parentheses are for information only.

1.3 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

[D977 Specification for Emulsified Asphalt](#)

[D2397/D2397M Specification for Cationic Emulsified Asphalt](#)

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee [D04](#) on Road and Paving Materials and is the direct responsibility of Subcommittee [D04.42](#) on Emulsified Asphalt Test.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[D3666 Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials](#)

[D6934 Test Method for Residue by Evaporation of Emulsified Asphalt](#)

[D6997 Test Method for Distillation of Emulsified Asphalt](#)

### 2.2 Other Standard:

[NF EN 13074 Recovery of Binder from Bitumen Emulsions by Evaporation<sup>3</sup>](#)

## 3. Significance and Use

3.1 The procedure described in this practice is used to obtain a residue from an emulsified asphalt that may be used for further testing in devices such as a dynamic shear rheometer. The lower evaporative temperatures of this procedure provide conditions that are very close to those of application techniques for these materials. This practice could be used in place of recovery techniques such as those of Test Methods [D6934](#) and [D6997](#), when the temperatures used in those standards would negatively affect the residue.

NOTE 1—The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of Specification [D3666](#) are generally considered capable of competent and objective testing, sampling, inspection, etc. Users of this standard are cautioned that compliance with Specification [D3666](#) alone does not completely ensure reliable results. Reliable results depend on many factors; following the suggestions of Specification [D3666](#) or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.

## 4. Reagents and Materials

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/m<sup>2</sup>. The mat may have a lip to contain the emulsified asphalt to the appropriate area.

NOTE 2—A silicone mat can be purchased at various restaurant supply stores and a good size for this application is a half-sheet pan size to fit in most laboratory ovens.

<sup>3</sup> Available from AFNOR (French Standard Institute), 11, rue Francis de Pressensé 93571 La Plaine Saint-Denis Cedex, France, <http://www.afnor.org>.

**TABLE 1 Emulsified Asphalt Quantity by Mat Area for Appropriate Spread Rate**

Emulsified Asphalt Spread Rate	Emulsified Asphalt quantity in grams for each area in m <sup>2</sup>			
	0.01 m <sup>2</sup>	0.0225 m <sup>2</sup>	0.04 m <sup>2</sup>	0.0625 m <sup>2</sup>
1.5 kg/m <sup>2</sup>	15.0 g	33.75 g	60.0 g	93.75 g
2.0 kg/m <sup>2</sup>	20.0 g	45.0 g	80.0 g	125.0 g

Note: The area dimensions correspond to the following square and circle sizes in mm:

Area	Square	Circle
0.01 m <sup>2</sup>	100 × 100 mm	56.4 mm radius
0.0225 m <sup>2</sup>	150 × 150 mm	84.6 mm radius
0.04 m <sup>2</sup>	200 × 200 mm	112.8 mm radius
0.0625 m <sup>2</sup>	250 × 250 mm	141.0 mm radius

4.2 *Spatula*—Palette knife or other suitable material for spreading the emulsified asphalt.

4.3 *Forced-Draft Oven*—Capable of maintaining a temperature of 25 ± 2 °C and 60 ± 2 °C. The racks should be able to be spaced a minimum of 10 cm from the top and bottom of the oven and with a spacing of a minimum of 4 cm between racks with samples. The oven racks must be checked for level, with a bubble level of 250 mm minimum length, from side to side and front to back of the oven.

## 5. Procedure

5.1 Pour the required amount of emulsified asphalt onto the silicone mat and spread evenly with a spatula to give a spread rate of 1.5 to 2.0 kg/m<sup>2</sup> of emulsified asphalt. The silicone mat should be supported by an oven tray or other flat tray or pan that will allow easy transfer to an oven. **Table 1** may be used as a guide for the quantities of emulsified asphalt necessary to give the appropriate spread rate for a given area.

5.2 Place the silicone mat with the emulsified asphalt into a 25 ± 2 °C forced-draft oven for 24 ± 1 h.

5.3 Transfer the silicone mat with the emulsified asphalt to a 60 ± 2 °C forced-draft oven for 24 ± 1 h.

5.4 Remove the silicone mat with the emulsified asphalt residue from the 60 °C oven and allow to cool at ambient lab conditions for 1 h prior to removal from the mat.

5.5 Carefully peel the emulsified asphalt residue from the mat using a wooden or plastic utensil to not damage the silicone mat. The residue can be kneaded into the appropriate sample size for testing (see 3.1) if appropriate gloves are worn to not allow skin contact with the residue.

NOTE 3—For softer binders, it may be necessary to cool the mat and residue in a refrigerator prior to removal.

NOTE 4—Examples of a wooden or plastic utensil may be a tongue depressor, silicone spatula, or plastic knife.

NOTE 5—The recovered binder may be stored in a sealed container at ambient laboratory conditions for up to one week prior to testing.

NOTE 6—The recovered binder properties may be changed if heated to a liquid state for further testing.

## 6. Keywords

6.1 bitumen; emulsified asphalt

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