

Standard Specifications for Transportation Materials and Methods of Sampling and Testing, and AASHTO Provisional Standards, 40th Edition (HM-40)

October 2020

Dear Customer:

AASHTO has issued an errata, which includes technical revisions, for the *Standard Specifications for Transportation Materials and Methods of Sampling and Testing, and AASHTO Provisional Standards, 40th Edition (HM-40)*. A description/list follows on the reverse.

To ensure that your edition is both accurate and current, re-download one file only—**HM-40-G3**—using the same instructions as you used to download the content initially.

AASHTO staff sincerely apologizes for any inconvenience.

List of Errata for *Standard Specifications for Transportation Materials and Methods of Sampling and Testing, and AASHTO Provisional Standards, 40th Edition (HM-40)*

Page Range	Standard Number	Incorrect Content	Corrected Content
MP 46-5	MP 46	Section 6.3 text wrongly duplicates Section 6.4 text. Please note that the table is correct.	Section 6.3 now reads: 6.3. <i>Direct Tension Cyclic Fatigue Test (TP 107)</i> : 6.3.1. <i>Specimen Conditioning and Aging</i> —Condition loose mix test samples according to R 30, Section 7.2 Short-Term Conditioning for Mechanical Property Testing. 6.3.2. <i>Test Temperature</i> —Select the test temperature as the 98 percent reliability climatic PG determined based on LTPP Bind software at the location of interest, but not exceeding 21°C. 6.3.3. <i>Test Criteria</i> —Compare the test results with the criteria given in Table 7, or criteria specified by the state highway agency (Note 7).
TP 113-4	TP 113	Section 5.5 gives the wrong number of decimal places for millimeters.	Section 5.5's first sentence now reads: Measure and record the sample thickness, <i>B</i> , in millimeters (inches) to 1 (4) decimal places to 0.1 mm (0.0001 in.).

Original Page Range	Standard Number	Wrongly Published Standard	Correct, Previously Omitted Standard
TP 137-1 through TP-12	TP 137	Continuous Measurement of Sideway-Force Friction Number for Highway Pavements	Box Test in Slip Form Paving of Fresh Portland Cement Concrete
TP 137-1 through TP 137-6			

6. CRACKING TESTS

- 6.1. Highway agencies should select one of the tests in this section.
- 6.2. *BBR Mixture Bending Test (TP 125):*
- 6.2.1. *Specimen Conditioning and Aging*—No specimen conditioning and aging procedure has been recommended at this time.
- 6.2.2. *Test Temperature*—For quality control, select the temperature 10°C above the specified binder low-temperature grade used in the mixture. For performance prediction, select at least three temperatures at 6°C intervals. The test temperatures of 4°C, 10°C, and 16°C above the specified binder grade used in the mixtures have been successfully used. Other temperatures can also be used depending on the project requirements.
- 6.2.3. *Test Criteria*—Compare the test results with the criteria given in Table 6, or criteria specified by the state highway agency (Note 6).

Table 6—BBR Mixture Bending Test Criteria

Traffic Level, million ESALs	Criteria
3 to <10	TBD
10 to <30	TBD
≥30	TBD

Note 6—Researchers at the University of Utah proposed a preliminary failure envelope on the creep modulus versus m-value Black Space diagram that was able to identify asphalt mixtures susceptible to thermal cracking (Romero, 2016).

- 6.3. *Direct Tension Cyclic Fatigue Test (TP 107):*
- 6.3.1. *Specimen Conditioning and Aging*—Condition loose mix test samples according to R 30 Section 7.2, “Short-Term Conditioning for Mechanical Property Testing.”
- 6.3.2. *Test Temperature*—Select the test temperature as the 98 percent reliability climatic PG determined based on LTPP Bind software at the location of interest, but not exceeding 21°C.
- 6.3.3. *Test Criteria*—Compare the test results with the criteria given in Table 7, or criteria specified by the state highway agency (Note 7).

Table 7—Direct Tension Cyclic Fatigue Test Criteria

Traffic Level, million ESALs	Criteria
3 to <10	TBD
10 to <30	TBD
≥30	TBD

Note 7—No criteria has been established at this time.

- 6.4. *Disc-Shaped Compact Tension Test (ASTM D7313):*
- 6.4.1. *Specimen Conditioning and Aging*—No specimen conditioning and aging procedure has been recommended.
- 6.4.2. *Test Temperature*—Select the test temperature of 10°C greater than the low temperature PG of the asphalt binder.

5. PREPARATION OF SAMPLES

- 5.1. *Preparation of Apparatus*—Place the mold on the base plate and insert the DENT end pieces.
- 5.2. Six samples shall be prepared using PAV-aged asphalt binder, two for each ligament length of 15, 10, and 5 mm (0.60, 0.40, and 0.20 in.) by fitting each of the three pairs of inserts firmly within their recessed positions in the silicone molds.
- 5.2.1. Asphalt binder shall be aged according to T 240 (RTFO) and R 28 (PAV). The aged asphalt binder shall then be heated for 1 h at $160 \pm 5^\circ\text{C}$ ($320 \pm 9^\circ\text{F}$) to ensure that the material readily flows when dispensed from the container into the prepared molds.
- Note 3**—The heating temperature may be raised to a maximum of 180°C (356°F) to provide a low-enough viscosity, but the sample material shall not be overheated.
- 5.3. Prior to pouring the asphalt binder into the mold, measure and record the actual ligament length, ℓ , to within 0.1 mm (0.004 in.).
- 5.4. After thorough stirring, pour the asphalt material into the mold, taking care not to entrain any air bubbles. Pour the material in a thin stream back and forth from end to end until the mold is level full. In filling the mold, take care not to disarrange the end pieces or distort the sample. Most accurate sample thicknesses are obtained by pouring the asphalt on an analytical balance at a constant weight for each specimen. Let the mold and contents cool to room temperature for 30 to 40 min, and then place the base plate and filled mold in the water bath maintained at the specified test temperature for 30 min.
- 5.5. Measure and record the sample thickness, B , in millimeters (inches) to 1 (4) decimal places to 0.1 mm (0.0001 in.). If the sample is flush with the mold, B will be equal to the thickness of the mold.

6. TEST PROCEDURES

- 6.1. Condition the samples on the base plates at $25 \pm 0.5^\circ\text{C}$ ($77 \pm 0.9^\circ\text{F}$) for $3 \text{ h} \pm 5 \text{ min}$ in their molds in a temperature controlled bath under a minimum of 25 mm (1 in.) of water.
- 6.2. Once conditioned, prepare the sample for testing, without causing excessive deformation or stress concentrations to the sample, by removing the sample from the mold. Keep the sample always under the surface of the water, and load it through the holes in the end pieces onto the testing apparatus' loading pins. The sample shall be loaded so there is a minimum of 25 mm (1 in.) of water below and above the sample. Allow the sample to sit and equilibrate for a minimum of 5 min before starting the test.