Standard Specification for

Preparation of Indirect Tension Performance Test Specimens

AASHTO Designation: PP 95-18 (2020)[1]

Technical Subcommittee: 2d, Proportioning of Asphalt–Aggregate Mixtures

Release: Group 3 (July)

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Proposed Standard Practice for

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1. SCOPE

1.1. This practice covers the preparation of 150-mm diameter by 38- to 50-mm thick cylindrical test specimens for use in indirect tension dynamic modulus tests. This practice is intended for dense-, gap-, and open-graded asphalt mixtures with nominal maximum aggregate sizes up to 25 mm.

1.2. *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this procedure to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to its use.*

2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards*:

- R 83, Preparation of Cylindrical Performance Test Specimens Using the Superpave Gyratory Compactor
- T 166, Bulk Specific Gravity of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens
- T 209, Theoretical Maximum Specific Gravity (G_{mm}) and Density of Asphalt Mixtures
- T 269, Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
- T 312, Preparation and Determining the Density of Asphalt Mixture Specimens by Means of the Superpave Gyratory Compactor

2.2. *ASTM Standard*:

- D5361, Practice for Sampling Compacted Asphalt Mixtures for Laboratory Testing

2.3. *Other Publications:*

- Barksdale, R.D., J. Alba, N.P. Khosla, Y.R. Kim, P.C. Lambe, and M.S. Rahman. Laboratory Determination of Resilient Modulus for Flexible Pavement Design, Final Report, National Cooperative Highway Research Program 1-28 Project, June 1997.
- Kim, Y. R., Y. Seo, M. King, and M. Momen. Dynamic Modulus Testing of Asphalt Concrete in Indirect Tension Mode. In *Transportation Research Record: Journal of the Transportation Research Board, No. 1891*, Transportation Research Board, National Research Council, Washington, DC, 2004.

3. TERMINOLOGY

3.1. *gyratory specimen*—Nominal 150 ± 9 mm in diameter by minimal 150-mm high cylindrical specimen prepared in a gyratory compactor.

3.2. *roadway specimen*—Specimens obtained from the pavement in accordance with ASTM D5361. Specimen dimensions consist of nominal 150 ± 9 mm in diameter with a layer thickness greater than 50 mm.

3.3. *test specimen*—Nominal 150 ± 9 mm diameter by 38-mm thick cylindrical specimen that is sawed and cored from the gyratory or roadway specimen.

3.4. *indirect tension (IDT)*—a method of loading a material by applying a compressive force on a cylindrical specimen in one direction, which results in a tensile stress and strain in the perpendicular direction due to the Poisson's effect, which describes lateral contraction or elongation due to axial elongation or contraction under loading, respectively.

4. SUMMARY OF PRACTICE

4.1. This practice presents methods for preparing 150 ± 9 mm in diameter by 38- to 50-mm thick cylindrical test specimens for use in an indirect tension dynamic modulus test.

5. SIGNIFICANCE AND USE

5.1. *This practice should be used to prepare specimens for the following standard test*:

- TP 131, Determining the Dynamic Modulus of Asphalt Concrete Using the Indirect Tension Test

5.2. This practice may also be used to prepare specimens for other non-standard tests requiring 150 ± 9 mm in diameter by 38 to 50 mm thick cylindrical test specimens.

6. APPARATUS

6.1. *Superpave Gyratory Compactor*—A compactor meeting the requirements of T 312 and capable of preparing specimens with a 150 ± 9 mm diameter and a minimum height of 150 mm.

6.2. *Mixture Preparation Equipment*—Balances, ovens, thermometers, mixer, pans, and other miscellaneous equipment needed to prepare gyratory specimens in accordance with T 312 and make specific gravity measurements in accordance with T 166, T 209, and T 269.

6.3. *Masonry Saw*—An air or water-cooled diamond bladed masonry saw capable of cutting specimens to a nominal height of 38 to 50 mm.

Note 1—Single saws have been successfully used to prepare specimens meeting the dimensional tolerances given in Section 10.5.3. Accurate sawing requires a fixture to securely hold the specimen during sawing and to control the feed rate.

6.4. *Calipers*—Calipers capable of measuring the specimen diameter, nominally 150 ± 9 mm, to the nearest 0.25 mm and nominal 38- to 50-mm thick specimens to the nearest 0.1 mm.

6.5. *Marking Device*—A marking device shall be used to mark mutually perpendicular axes on the front and back faces of the specimen through the center. An example is shown in Figure 1.