

Illinois Modified Test Procedure
 Effective Date: March 1, 2003
 Revised Date: [July 7, 2022](#)

Standard Method of Test
 For
Resistance of Compacted [Asphalt Mixtures](#) to Moisture-Induced Damage

Reference AASHTO T 283-21

AASHTO Section	Illinois Modification
1.1	Replace the first sentence with the following: This method covers preparation of specimens and the measurement of the change of diametral tensile strength resulting from the effects of water saturation and accelerated water conditioning of compacted asphalt mixtures.
2.1	Replace with the following: <i>Referenced Illinois modified AASHTO Standards:</i> <ul style="list-style-type: none"> ▪ R 30, Mixture Conditioning of Hot-Mix Asphalt (HMA) ▪ T 166, Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens ▪ T 209, Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures ▪ T 245, Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus ▪ T 312, Preparing and Determining the Density of Hot-Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
2.1.1	Illinois Manual of Test Procedures: <ul style="list-style-type: none"> ▪ Appendix B4, Hot-Mix Asphalt Test Strip Procedures ▪ Appendix B6, Hot-Mix Asphalt QC/QA Initial Daily Plant and Random Samples ▪ Appendix B7, Hot-Mix Asphalt QC/QA Procedure for Determining Random Density Locations ▪ Appendix B17, Procedure for Introducing Additives to Hot Mix Asphalt Mixtures and Testing in the Lab ▪ Appendix E3, PFP and QCP Random Density Procedure ▪ Appendix E4, PFP and QCP Hot Mix Asphalt Random Jobsite Sampling
2.2	<ul style="list-style-type: none"> ▪ Delete
3.1	Replace the first sentence with the following: This method is intended to evaluate the effects of saturation and accelerated water conditioning of compacted asphalt mixtures.
3.2	Replace with the following: Numerical indices of retained indirect-tensile properties are obtained by comparing the properties of laboratory specimens subjected to moisture conditioning with the similar properties of dry specimens.

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4.1	Replace the fourth sentence with the following: The other subset is subjected to vacuum saturation, followed by a warm-water soaking cycle, before being tested for indirect tensile strength.
5.1	Replace with the following: Equipment for preparing and compacting specimens from T 312.
5.3	Replace with the following: Balance and water bath from T 166 for immersing the specimen under water while suspended under a weighing device.
5.5	Delete
5.6	Delete
5.7	Delete
5.12	Replace the second sentence with the following: For 100 mm (4 in.) diameter field-mixed, field-compacted pavement cores only, the loading strips shall be 12.7 mm (0.5 in.) wide and for all specimens 150 mm (5.91 in.) diameter, the loading strips shall be 19.05 mm (0.75 in.) wide.
6.1	Replace the first paragraph with the following: Prepare mixture for at least six specimens for each test, half to be tested dry and the other half to be tested after partial saturation and moisture conditioning (Note 1).
6.1.2.1 New Section	When an anti-stripping additive is used, the procedure in Appendix B17 of the Illinois Manual of Test Procedures for adding and mixing the additive shall be followed.
6.1.2.2 New Section	Odor neutralizing additives, if used, shall be added to the asphalt binder according to the manufacturer's recommended dosage rate and procedure prior to mixing the asphalt with the heated aggregates.
6.2	Replace the first two sentences with the following: Prepared compacted specimens shall be 7.0 ± 1.0 percent air voids. This level of voids can be obtained by adjusting the mass of the mixture, or adjusting the number of gyrations or specimen height in T 312. The most effective way to adjust voids, while maintaining a compacted height of 95 mm is to make slight changes in the weight of the loose material to be compacted.

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6.3	Replace with the following: Specimens 150 mm (5.91 in.) diameter by 95 ± 5 mm (3.75 ± 0.20 in.) thick are used.
6.4	Replace with the following: Place the mixture in a pan and cool at room temperature.
6.5	Replace with the following: Short-term aging of laboratory prepared mixtures shall be done according to Illinois-modified AASHTO R 30.
6.6	Replace with the following: Compact the specimens according to the method in T 312. The mixture shall be compacted to 7.0 ± 1.0 percent air voids.
6.7	Delete
6.8	Add the following before the first sentence: Allow the extracted specimens to cool to a room temperature 25 ± 5 °C (77 ± 9 °F).
6.9	Replace the second sentence with the following: The air void content shall be within 7.0 ± 1.0 percent.
7.1	Replace with: Obtain field-mixed asphalt mixture sample in accordance with Appendix B.6 or E.4 of sufficient size to determine G_{mm} and make at least six specimens. Appendix B.6 shall be used in QC/QA applications and Appendix E.4 shall be used in QCP or PFP applications.
7.3	Replace with the following: Make at least six specimens for each test, half to be tested dry and the other half to be tested after partial saturation and moisture conditioning (Note 3).
7.3.1	Replace the first two sentences with the following: Prepared compacted specimens shall be 7.0 ± 1.0 percent. This level of voids can be obtained by adjusting the mass of the mixture, or adjusting the number of gyrations or specimen height in T 312. The most effective way to adjust voids, while maintaining a compacted height of 95 mm is to make slight changes in the weight of the loose material to be compacted.

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7.4	Replace with the following: Specimens 150 mm (5.91 in.) in diameter by 95 ± 5 mm (3.75 ± 0.20 in.) thick are used.
7.5	Replace with the following: No loose-mix curing as described in Section 6.5 shall be performed on the field-mixed samples. After sampling, place the mixture in an oven until it reaches the compaction temperature ± 3°C (5°F). Then, compact the specimen according to the method in T 312. The mixture shall be compacted to 7.0 ± 1.0 percent air voids.
7.6	Add the following before the first sentence: Allow the extracted specimens to cool to a room temperature of 25 ± 5°C (77 ± 9°F).
7.7	Replace with the following: Determine the air voids according to Sections 9.3 and 9.4. The air void content shall be within 7.0 ± 1.0 percent.
8.1	Replace the first sentence with the following: Select locations on the completed pavement to be sampled and obtain cores according to Appendix B.7 or E.3. Appendix B.7 shall be used in QC/QA applications and Appendix E.3 shall be used in QCP or PFP applications.
8.1.1 New Section	The pavement may be cored with the objective of performing a forensic analysis of the in-situ conditions of the in-place, compacted mixture. In that case, the core specimens should be kept in a leak-proof plastic bag until testing to preserve the in-situ conditions. The testing should be conducted as soon as possible after coring.
9.1	Replace with the following: Use the gyratory compactor height printout sheet to determine the specimen thickness (t). If the gyratory height printout sheet is not available determine the specimen thickness by taking four measurements at approximately quarter points on the periphery of the specimen and recording the average of these measurements as the thickness of the specimen.

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9.6	Replace the first sentence with the following: For those specimens to be subjected to vacuum saturation and a warm-water soaking cycle, calculate the volume of air voids (V_a) in cubic centimeters using the following equation:
10.1	Replace with the following: One subset will be tested dry, and the other will be partially vacuum-saturated and soaked in warm water before testing.
10.2	Replace with the following: The dry subset will be stored at room temperature until testing. The specimens shall then be placed in a $25 \pm 1^\circ\text{C}$ ($77 \pm 1.8^\circ\text{F}$) water bath for 2 hrs \pm 10 min with a minimum 25 mm (1 in.) of water above their surface. Then test the specimens as described in Section 11.
10.3	Delete
10.4.1	Replace with the following: Place the specimen in the vacuum container. Fill the container with potable water at room temperature so that the specimens have at least 25 mm (1 in.) of water above their surface.
Note 5	Replace with the following: Apply a vacuum of 13 to 67 kPa absolute pressure (10 to 26 in. Hg partial pressure) for a short time (approximately 1 to 10 minutes).
10.4.3	Replace with the following: Remove the vacuum and leave the specimen submerged in water for a short time (approximately 1 to 10 minutes).
10.4.9	Delete.
10.4.10	Replace the first sentence with the following: Place the specimens, flat side down, into a $60 \pm 1^\circ\text{C}$ ($140 \pm 1.8^\circ\text{F}$) water bath for 24 hrs \pm 1 hr. Delete the last sentence.

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10.4.11	<p>Replace the first sentence with: After 24 hrs ± 1 hr in the 60 ± 1°C (140 ± 1.8°F) water bath, remove the specimens and place them in a water bath at 25 ± 1°C (77 ± 1.8°F) for 2 hrs ± 10 min.</p> <p>Replace the fourth sentence with: Not more than 15 min should be required for the water bath to reach 25 ± 1°C (77 ± 1.8°F).</p>
11.1	<p>Replace with: Determine the indirect-tensile strength of dry and conditioned specimens at 25 ± 1°C (77 ± 1.8°F).</p>
11.1.1	<p>Replace the first sentence with the following: Remove the specimen from the 25 ± 1°C (77 ± 1.8°F) water bath.</p> <p>Insert the following at the end: Note 7: If a chart recorder is used, the 10,000 pound scale should be used for 150 mm (5.91 in.) specimens and the 5,000 pound scale should be used for 4 in. (100 mm) field pavement core specimens.</p>
11.1.2	<p>Replace the last sentence with the following: Inspect the interior surface for evidence of cracked or broken aggregate; visually estimate the approximate degree of moisture damage on a scale from “1” to “3” (with “3” being the most stripped) according to the Illinois procedure “Stripping of Hot-Mix Asphalt Mixtures Visual Identification and Classification” and record the observations.</p>
12.1 New Notes	<p>Add the following at the end: Note 8. The actual diameter of a gyratory specimen is 150 mm (5.91 in.).</p> <p>Note 9: If the strength is converted from metric to English units, use the factor: 1 kPa = 0.14504 psi (1 psi = 6.895 kPa).</p>

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12.2	<p>Replace the first sentence with the following: Express the numerical index of resistance of asphalt mixtures to the detrimental effect of water as the ratio of the original strength that is retained after the moisture conditioning.</p> <p>Add the following at the end: The minimum TSR for 150 mm (5.91 in.) specimens shall be 0.85.</p> <p>The minimum TSR for 4-inch (100 mm) field-mixed, field-compacted pavement cores only shall be 0.75.</p>
15.1	Delete.

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