
Standard Method of Test for Determining the Interlayer Shear Strength (ISS) of Asphalt Pavement Layers

AASHTO Designation: TP 114-18 (2022)¹

Technically Revised: 2018

Reviewed but Not Updated: 2022

Editorially Revised: 2021

Technical Subcommittee: 2c, Asphalt–Aggregate Mixtures



**American Association of State Highway and Transportation Officials
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1. SCOPE

- 1.1. This test method covers the determination of the interlayer shear strength of asphalt pavement layers using laboratory-prepared samples or core samples.
- 1.2. This test can be performed on 150-mm (6-in.) or 100-mm (4-in.) diameter specimens of asphalt pavement.
- 1.3. This test is applicable if the asphalt overlay layer and the base layer are both 50 ± 5 mm (2.0 ± 0.2 in.) thick. The total specimen thickness must not exceed 150 mm (6 in.). Layers may be saw cut to the recommended layer thickness.
- 1.4. *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all safety concerns 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 use.*
- 1.5. *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 R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
 - M 231, Weighing Devices Used in the Testing of Materials
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
 - T 312, Preparing and Determining the Density of Asphalt Mixture Specimens by Means of the Superpave Gyratory Compactor

3. TERMINOLOGY

- 3.1. *interlayer shear strength (ISS)*—the maximum capacity of the interface to resist failure due to shearing stresses.

4. SUMMARY OF METHOD

- 4.1. The Louisiana Interlayer Shear Strength Tester (LISST) was developed for the characterization of interface shear strength of cylindrical specimens. The device (see Figure 1) consists of two main parts: a shearing frame and a reaction frame. Only the shearing frame is allowed to move, while the reaction frame is stationary. A cylindrical specimen is placed inside the shearing and reaction frames and is locked in place with collars. Loading is then applied to the shearing frame. As the vertical load is gradually increased, shear failure occurs at the interface.

5. SIGNIFICANCE AND USE

- 5.1. Tack coats are applied on a pavement surface before overlay construction to ensure adequate interface bond strength between two layers. If the interface cannot provide enough strength to resist stresses due to traffic and environmental loading, shear failure may occur at the interface. Poor interface bond strength may also accelerate the appearance of other distresses such as slippage and surface cracks.

6. APPARATUS

- 6.1. *Louisiana Interlayer Shear Strength Tester (LISST)*—The device used for the interlayer shear strength test shall be designed such that it adapts to most universal testing machines, has a nearly frictionless linear bearing to maintain vertical travel, accommodates sensors that measure the vertical and horizontal displacements, provides a specimen locking mechanism, applies consistent normal loads, and accommodates 100- or 150-mm (4- or 6-in.), or both, sample diameters. It is recommended that the clearance for the LISST device in the loading frame be 304.8 mm (12 in.). The gap between the loading frame and the reaction frame shall be 12.7 mm ($\frac{1}{2}$ in.). The device is illustrated in Figures 1 and 2.

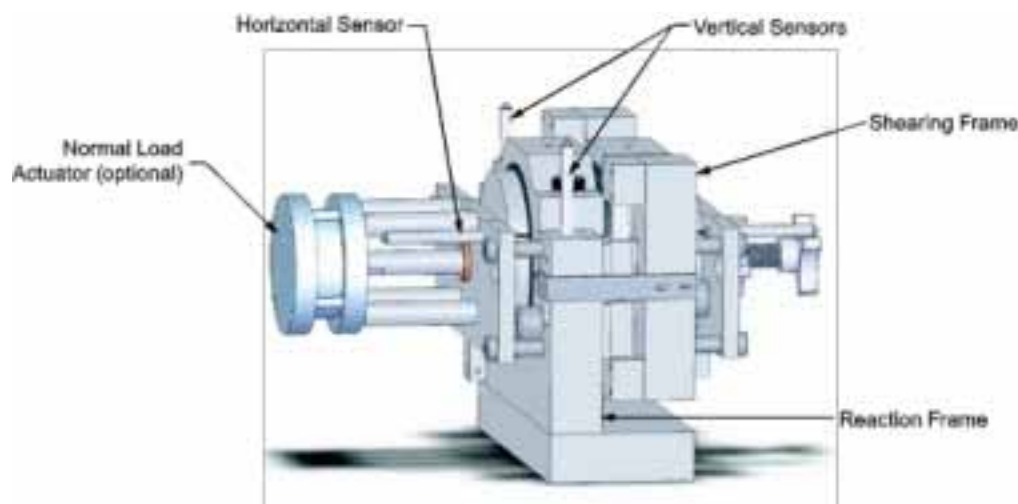


Figure 1—3-D Illustration of the Louisiana Interface Shear Strength Tester (LISST) Device