



**INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF MATERIALS AND TESTS**

**VERIFYING VACUUM CHAMBERS
ITM No. 905-26**

1.0 SCOPE.

- 1.1** This test method covers the procedure for verifying the vacuum chambers used in AASHTO T 331 and ITM 572. It also provides a procedure for verifying the digital gauge used in AASHTO T 209 with **an annually calibrated/verified vacuum pressure (Torr)** gauge as the measurement standard.
- 1.2** This ITM may involve hazardous materials, operations, and equipment and may not address all of the safety problems associated with the use of the test method. The user of the ITM is responsible for establishing appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

2.0 REFERENCES.

2.1 AASHTO Standards.

- T 209 Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- T 331 Bulk Specific Gravity and Density of Compacted asphalt Mixtures Using Automatic Sealing Method

2.2 ASTM Standards.

- D7227 Rapid Drying of Compacted Asphalt Specimens Using Vacuum Drying Apparatus

2.3 ITM Standards.

- 572 Drying HMA Mixtures

3.0 TERMINOLOGY. Definitions for terms and abbreviations shall be in accordance with the Department's Standard Specifications, Section 101.

4.0 SIGNIFICANCE AND USE. This ITM is used by laboratory personnel to standardize the vacuum chambers used in AASHTO T 331 and ITM 572. It can also be utilized to verify the digital vacuum gauge used in AASHTO T 209 using a calibrated/verified **vacuum pressure (Torr)** gauge **as** the measurement standard.

5.0 APPARATUS.

- 5.1** Vacuum **Pressure (Torr)** Gauge capable of being placed inside the vacuum chamber and has a minimum range of **35** to 0 mm Hg that is readable to a minimum of 1 mm Hg. The gauge shall be calibrated/**verified** annually **for use as the measurement standard.** See Note 1.

Note 1—Measurement Standard is defined as a device infrequently used only for the standardization of other devices and not used in the day-to-day operations of the laboratory.

6.0 PROCEDURES.

6.1 Vacuum Chamber: AASHTO T 209, T 331, and ITM 572.

- 6.1.1** Record the identification number and date of calibration of the measurement standard vacuum gauge.
- 6.1.2** Record the identification number of the device being standardized.
- 6.1.3** Place the vacuum **pressure** gauge inside the vacuum chamber.
- 6.1.4** Start the apparatus and allow the vacuum to remove the air from the vacuum chamber.
- 6.1.5** Record the reading on the vacuum **pressure** gauge at the maximum vacuum level achieved **for the T 331 and ITM 572 chambers.**
- 6.1.6** **Record the readings on the vacuum pressure gauge and the digital vacuum gauge for T 209.**

7.0 TOLERANCE.

- 7.1** The reading of the vacuum gauge used for AASHTO T 331 shall be 10 mm Hg or less.
- 7.2** The reading of the vacuum gauge used for ITM 572 shall be 6 mm Hg or less.
- 7.3** A maximum of ± 2 mm Hg offset for the digital vacuum gauge used in T 209 may be applied and is required to be clearly indicated at the test method point of use. **The reading of the digital vacuum gauge shall be 30 ± 5 mmHg.**

**VACUUM CHAMBER VERIFICATION
ITM 905**

Vacuum Chamber (AASHTO T 331 / CoreLok & ITM 572 / CoreDry)

EQUIPMENT:

Vacuum Pressure Gauge ID: _____
(Measurement Standard)

Vacuum Pressure Gauge calibration/verification date: _____

Device being verified: _____

VERIFICATION:

Reading on measurement standard _____
(less than 10 torr T 331 or less than 6 mm Hg ITM 572)

Remarks: _____

Verified by: _____ Date: _____

VACUUM GAUGE VERIFICATION
ITM 905/AASHTO T 209

EQUIPMENT:

Vacuum Pressure Gauge ID: _____
(Measurement Standard)

Vacuum Pressure Gauge calibration/verification date: _____
(Measurement Standard)

Device being verified: _____

VERIFICATION:

Vacuum reading of Measurement Standard: _____ (between 27-28, to the nearest 0.5 mm)

Vacuum reading of Digital Pressure Gauge: _____

Difference between Measurement Standard and Digital Pressure Gauge being verified:
_____ (not to exceed 2 mm)

If necessary, offset (+/-) clearly displayed where the digital pressure gauge is used: _____
(Yes/NA)

Remarks: _____

Verified By: _____ Date: _____