

**1830 INTERLAB COMPARISON PROCEDURES****1830.1 SCOPE**

This method covers the correlation of test results on bituminous paving mixtures between the Mn/DOT Central Office Mix Design Lab and other facilities.

**1830.2 APPLICABLE DOCUMENTS**

- A. AASHTO T 164, Extraction of Bitumen from Bituminous Paving Mixtures. (Mn/DOT modified). See Section 1851 and 1852.
- B. AASHTO T 166, Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens (Mn/DOT modified). See Section 1806.
- C. AASHTO T 209, Maximum Specific Gravity of Bituminous Paving Mixtures. (Mn/DOT modified). See Section 1807.
- D. AASHTO T 245, Resistance to Plastic Flow of Bituminous Mixtures using Marshall Apparatus. (Mn/DOT modified). See Section 1805.
- E. AASHTO T 269, Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures. (Mn/DOT modified). See Section 1808.
- F. AASHTO T 308, Determining the Asphalt Binder Content of Hot Mix Asphalt by the Ignition Method. (Mn/DOT modified). See Section 1853.
- G. AASHTO T312, Preparing and Determining the Density of HMA Specimens by means of the SHRP Gyratory Compactor. (Mn/DOT modified). See Section 1820.
- H. ASTM D4867, Effect of Moisture on Asphalt Concrete Paving Mixtures. (Mn/DOT modified Lottman). See Section 1813.

**NOTE 1:** Refer to Section 1809 for procedures on bituminous mixture samples.

**1830.3 PROCEDURE**

- A. For Marshall testing, acquire or prepare at least 45kg (100 lbs) of bituminous mixture and carefully split the sample into two equal parts.

For Gyratory testing acquire or prepare at least 50kg (110 lbs) of bituminous mixture and carefully split into two equal parts.

For Lottman testing acquire or prepare at least 50kg (110 lbs) of bituminous mixture and carefully split into two equal parts.

- B. Place each of the parts into sample sacks. Retain one part of the split and deliver the other part to the other facility. Both parts should be stored/transported at room temperature and kept away from moisture.
- C. Coordinate between the two facilities so that both parts are run on the same day.
- D. Place sample and sack in a  $143 \pm 5.6$  °C ( $290 \pm 10$  °F) oven. When the mixture is warm enough to be workable (usually about 70 °C (160 °F), remove from the oven, place the mixture in a pan, thoroughly mix the material and batch out two 2,000 gram (minimum) samples for Maximum Specific Gravity (Rice Voids), Manual Section 1807.
- E. At the same time for Marshall testing, batch out 12 samples (at a previously agreed weight) into preheated Marshall molds.

At the same time for Gyratory testing batch out 3 samples (at a previously agreed weight) into preheated molds.

For Lottman testing batch out either 6 to 9 specimens for Marshall mixtures or 4 to 6 specimens for gyratory mixtures. Batch size is dependent upon the pilot specimen meeting the required voids. (Refer to Section 1813).

**NOTE 2:** If determining the percent asphalt cement is necessary follow the decided method (either centrifuge or ignition). Refer to section 1809 for batching out test samples and sections 1852 or 1853 for the testing procedure.

Return the molds with the mixture to the oven and bring the specimens to a temperature of  $135 \pm 5.6$  °C ( $275 \pm 10$  °F) or to the agreed temperature. (Do not heat the material for more than 30 minutes after it reaches 135 °C. [275 °F].) When temperature is achieved: for the Marshall method compact six specimens at 50 blows per side and six specimens at 75 blows per side in accordance with Manual Section 1805 and for Gyratory mixtures compact three specimens at the required number of gyrations in accordance with Manual Section 1820. For Lottman mixtures compact in accordance with Manual Section 1813.

- F. Complete tests and calculations using procedures listed under Applicable Documents (1830.2). Specimens with 50 and with 75 blows are to be calculated separately.

**1830.4**      PRECISION

- A.      The difference in maximum specific gravity of the average of two tests between the two facilities shall not exceed 0.019; nor shall the two individual tests at the same facility vary by more than 0.011.
- B.      The difference in the bulk specific gravity of the average of four to six Marshall specimens shall not exceed 0.030 between facilities, nor shall any individual specimen at the same facility vary from the average by more than 0.020.

**NOTE 3:** Discard specimens more than 0.020 from the average and recalculate the average; but, do not use less than four specimens.

For Gyratory specimens, the difference in the bulk specific gravity between individual specimens shall be no greater than 0.020.

- C.      The Marshall Stability value of the other facility shall not vary from the C.O. Mix Design Lab by more than 20 percent.
- D.      The difference in the extracted percent asphalt cement between two facilities shall be 0.4 or less when using the chemical centrifuge and 0.3 or less when using the ignition oven.
- E.      Should the test results of the other facility fail to fall within the above criteria, that portion of the test will have to be repeated using another sample. The second sample should be large enough so that the other facility can run sufficient tests to calibrate equipment and/or adjust procedures so that results are within established limits.
- F.      Initially, other facilities should correlate with Mn/DOT's C.O. Mix Design Lab annually, whenever there is a change in equipment or the equipment is moved. Whenever possible correlation should be done prior to the start of the construction season and allow sufficient time for several repeats.