

CITY OF COLUMBUS, OHIO

**SUPPLEMENT 1036
METHOD OF TEST FOR
DETERMINATION OF PERCENT AIR VOIDS IN COMPACTED
DENSE ASPHALT CONCRETE MIXTURES**

October 31, 2011

1036.1 SCOPE

This method covers determination of the percent air voids in compacted dense asphalt concrete mixtures.

1036.2 PROCEDURE

- A. For mix design, prior to determining the maximum specific gravity (MSG) or compacting specimens for bulk specific gravity (BSG), condition the sample to be tested according to the requirement in the City of Columbus CMS at the compaction temperature. For quality control, condition the sample in an oven set at the compaction temperature. When determining the MSG or BSG in accordance with 441.09, this conditioning is not required when the mix is stored in a surge or storage bin for greater than 1 hour prior to sampling. When determining the MSG or BSG in accordance with 442.05, this conditioning is not required when the mix is stored in a surge or storage bin for greater than 2 hours prior to sampling.
- B. Determine the MSG per AASHTO T 209, Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures, (Rice Method) using the “Supplemental Procedure for Mixtures Containing Porous Aggregate”.

A plastic pycnometer is not allowed. Metal or glass pycnometers must have a 4000 ml minimum volume.

In place of the electric fan dry back procedure an alternate forced air system may be used as long as the first 15 minute interval weight to achieve less than 0.05 percent mass loss from the preceding weight is read at no less than 1 hour and that forced air flow over the sample(s) is constant during a test and over multiple tests. This system must be approved by the Laboratory.

The residual pressure manometer placed in the vacuum system per AASHTO T 209 may be a digital manometer. Obtain Laboratory approval of digital manometer models. Provide documentation for NIST traceability. Provide a connection near the vacuum pump for attaching a vacuum gauge as a check when needed. Immediately replace failed manometers with a functioning manometer before proceeding with testing.

- C. Determine the BSG of a compacted mixture per ASTM D 2726. If the water bath for the specimens is not maintained at 77°F (25°C), use the correction factor (K) specified in ASTM D 2726.

Do not exceed 350°F (177°C) in the destructive dry back of BSG samples. It is recommended for non-destructive purposes that the BSG dry back temperature be no more than 120°F (49°C).

- D. Determine percent air voids in a compacted mixture by ASTM D 3203, using the procedure for dense asphalt concrete mixtures.