



## WSDOT SOP 737

### *Procedure for the Forensic Testing of HMA Field Cores*

#### 1. Scope

This method describes the process for testing Hot Mix Asphalt (HMA) field cores for asphalt content, gradation, volumetric analysis, Hamburg Wheel-Test, Indirect Tensile Strength and asphalt binder grade determination.

1.1 This standard covers the procedural steps required for forensic testing of HMA field cores. Cores for forensic testing may range in size from 4-12 inches, although many specific test procedures require the core specimen to be six inches.

1.2 The values stated in English units are to be regarded as the standard.

#### 2. Significance And Use

2.1 Approvals of the material for HMA are required prior to use per *Standard Specifications* Section 1-06.1.

2.2 Samples obtained in accordance with this procedure, shall be obtained using WSDOT SOP 734, "Sampling Hot Mix Asphalt after Compaction (Obtaining Cores)".

#### 3. Reference Documents

Refer to applicable test methods within this procedure.

#### 4. Apparatus

Refer to applicable test methods within this procedure.

#### 5. Safety

This standard does not purport to address all of the safety concerns, associated with its use.

It is the responsibility of the user of this standard operating procedure to establish a pre activity safety plan prior to use.

#### 6. Test Site Location

The sample location and quantity of cores to be obtained shall be determined by the test procedure to be performed or agency requirements.

## 7. Procedures

Perform procedures as needed to obtain desired test results:

### 7.1 Obtain cores per WSDOT SOP 734, “Sampling Hot Mix Asphalt after Compaction”.

The required quantity and size of cores for each procedure shall be as shown in Table 1:

Procedure	Size	Number of Cores	Special Instructions
AASHTO T331, “Standard Method of Test for Bulk Specific Gravity (Gmb) Density of Compacted Hot Mix Asphalt (HMA) Using Automatic Vacuum Sealing Method”	4” or 6”	1	
WSDOT FOP for AASHTO T209, “Theoretical Maximum Specific Gravity Density of Hot Mix Asphalt Paving Mixtures”	4” or 6”	1	
WSDOT FOP for AASHTO T308, “Determining the Asphalt Binder Content of Hot Mix Asphalt by the Ignition Method”	6”	1	
WSDOT FOP for AASHTO T27/11, “Mechanical Analysis of Extracted Aggregate”	6”	1	
WSDOT FOP for AASHTO T324, “Hamburg Wheel-Track Testing of Compacted Hot Mix Asphalt”	6”	2	Obtain cores 6” apart for each determination
WSDOT FOP for ASTM D 6931, “Standard Test Method for Indirect Tensile Strength of Bituminous Mixtures”	6”	3	Obtain cores 6” apart for each determination
AASHTO R29, “Standard Practice for Grading or Verifying the Performance Grade (PG) of an Asphalt Binder”	6”	2	Obtain cores 6” apart for each determination

**Table 1**

### 7.2 Remove moisture from cores per AASHTO R 79, “Vacuum Drying Compacted Asphalt Specimens”.

### 7.3 Determine core density per AASHTO T331, “Standard Method of Test for Bulk Specific Gravity (Gmb) and Density of Compacted Hot Mix Asphalt (HMA) Using Automatic Vacuum Sealing Method”, and WSDOT FOP for AASHTO T209, “Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt Paving Mixtures”. Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt Paving Mixtures data from corresponding field testing may be substituted in lieu of testing core material.

**Note 1:** AASHTO T331 shall be performed prior to WSDOT FOP for AASHTO T 209. Before performing T 209 all shaved or bare aggregate surfaces either from coring, surface wear or handling of the specimen shall be removed and separated from the specimen by carefully picking them from the specimen using a sharp tipped tool. Care must be taken not to remove fully coated aggregate. Removed particles shall be discarded and not included with the WSDOT FOP for AASHTO T209 test specimen.

- 7.4 Determine asphalt content per WSDOT FOP for AASHTO T308, “Determining the Asphalt Binder Content of Hot Mix Asphalt by the Ignition Method”, if an ignition furnace correction factor (IFCF) is available. Otherwise, perform AASHTO T 164, “Standard Method of Test for Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt”.
- 7.5 Determine aggregate sieve analysis per WSDOT FOP for AASHTO T 27/11, “Mechanical Analysis of Extracted Aggregate”. WSDOT FOP for AASHTO T27/11 shall be performed following binder extraction per WSDOT FOP for AASHTO T 308, “Determining the Asphalt Binder Content of Hot Mix Asphalt by the Ignition Method” or AASHTO T164, “Standard Method of Test for Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt”.
- 7.6 Determine rutting and moisture-susceptibility of HMA per WSDOT FOP for AASHTO T324, “Hamburg Wheel-Track Testing of Compacted Hot Mix Asphalt”.
- 7.7 Determine Indirect Tensile Strength (IDT) per WSDOT FOP for ASTM D6931, “Standard Test Method for Indirect Tensile Strength of Bituminous Mixtures”.
- 7.8 Determine grade of asphalt per AASHTO R29, “Standard Practice for Grading or Verifying the Performance Grade (PG) of an Asphalt Binder”. Extract the binder in accordance with AASHTO R59, “Recovery of Asphalt Binder from Solution by Abson Method” or ASTM D1856, “Standard Test Method for Recovery of Asphalt from Solution by Abson Method”, for each asphalt grade determination.

**Note 2:** Binder specimens for AASHTO R29, Standard Practice for Grading or Verifying the Performance Grade (PG) of an Asphalt Binder may be obtained in conjunction with AASHTO T164, Standard Method of Test for Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt.

