Standard Method of Test for

Field Procedure for Preparing Gyratory Specimens on Hot Mix Asphalt Mixtures Using the Gyratory Compactor

SCDOT Designation: SC-T-103 (05/10)

1. SCOPE

1.1 This method covers the field procedure for preparing gyratory specimens to determine volumetric properties of Hot Mix Asphalt Mixes when required by specifications.

2. REFERENCE DOCUMENTS

2.1 AASHTO M-231, AASHTO T-312, AASHTO TP-71, SC-T-62, SC-T-72, SC-T-93, and SC-T-101

3. APPARATUS

3.1 Gyratory compactor and molds meeting AASHTO T-312. The internal angle must be verified annually by a technician with a gyratory internal angle device according to AASHTO TP-71. The internal angle must be 1.16° +/- 0.02°.

3.2 Thermostatically controlled mold oven - capable of maintaining up to 310°F (+/-5°F of target temperature).

3.3 Thermostatically controlled forced draft heating oven for reheating samples if necessary - capable of maintaining 265°F -335°F (+/-5°F of target temperature).

3.4 Balance of sufficient capability (12 kg capacity and sensitive to 0.1gm) meeting the requirements of AASHTO M-231.

3.5 Misc. Items: Calibrated dial thermometer or digital thermocouple (range of 50 to 400°F+) and sensitive to 5°F or better, circular paper disks (150 mm diameter).

4. TEST SPECIMENS

4.1 A minimum of sixty minutes prior to molding specimens, heat 2-3 complete molds (base plate, mold, and collar) to a temperature between 265°F and 310°F in a thermostatically controlled oven. Turn on gyratory compactor and allow the machine to run through the initial set-up. (ideal temperature is at target compaction temperature)

4.2 Obtain the random tonnage for the Lot using SC-T-101. Select hauling truck which contains the correct sample tonnage. Check temperature of mix in truck. If temperature is between 265°F and 325°F*, take a large enough sample for an

ignition oven test, two MSG test, two to three gyratory specimens, as well as enough sample for SCDOT verification-referee testing. If temperature is not hot enough on the truck, ensure that it meets the minimum temperature for that binder grade and take the sample from the next available truck. Make note of the truck on the plant report if the sample is not taken from the random tonnage table for that particular acceptance test.
*335°F for mixes containing PG 76-22.

4.3 Quarter two or more samples to be used as volumetric test specimens using SC-T-72 or SC-T-93. Weigh approximately 4400-5200 grams to ensure that sample meets height requirements of 110-120mm after desired number of gyrations. (Most job mixes will have footnote of estimated weight).

4.4 Place the hot mix samples in bowls or large sample pans until the compaction temperature can be checked. Insert a dial thermometer into the mix and move thermometer around the bowl or pan to ensure an accurate reading. The mix temperature range before compacting should be 295 $\pm$ 5°F*. If the temperature is at or slightly above target temperature range, proceed to section 4.5. If temperature is below the target compaction temperature range, place the HMA samples into sample pans and reheat the samples. The samples should be put into a preheated oven not to exceed 325°F, but for no longer than 1 hour. Be sure the mix is evenly spread out in the pan no more than 2 inches in thickness to assist with reheating. Recheck the HMA temperature frequently to ensure that specimens are close to compaction temperature range prior to molding.
* PG binder suppliers may furnish a recommended compaction temperature based on rotational viscosity test or other recommendations if using a PG 76-22, etc. The contractor must document this temperature on their plant report if different from the recommended temperature in this section.

4.5 Remove a hot mold from oven and place a circular 150 mm diameter disc of paper in bottom of the mold before the mixture is added. Once the mix is determined to be within the compaction temperature range, place the mixture in a gyratory mold being careful not to segregate the mixture. Place a circular 150 mm diameter disc of paper on top of the mixture in the mold.

4.6 Place the mold with the HMA mixture in the gyratory compactor. Apply the number of gyrations specified on the job mix. Use manufacturer's guidelines when using the gyratory compactor or follow the procedure in AASHTO T-312.

4.7 Once the desired number of gyrations is completed, remove the specimen from the gyratory compactor and allow the specimen to air cool at room temperature until the specimen reaches a constant weight. A circulating desk fan or other suitable apparatus may be used to assist in cooling the compacted specimens.

4.8 Remove the additional samples from oven or immediately compact additional gyratory specimens using the method used in steps 4.4-4.7 above.

5. PROCEDURE

5.1 Verify that specimens are between 110-120 mm in final height. If they do not meet these criteria, discard samples, and repeat process with more or less material to make specimens fall within height guidelines.

5.2 Check volumetric properties of gyratory specimens using SC-T-68.

6. CALCULATIONS

6.1 None

7. REPORT

7.1 Record field volumetric properties on Ignition Oven Worksheet Form PLT1 and report on Form 400.05. HMA Mix Design shown on Form MD 410 and reported on Form MD 416.