Standard Method of Test for

Determination of Dry Aggregate Gradation of Hot Mix Asphalt Extracted Aggregates

SCDOT Designation: SC-T-102 (03/10)

1. SCOPE

This method covers the mechanical analysis of extracted aggregate from hot mix asphalt.

2. REFERENCED DOCUMENT

2.1 AASHTO Standards
M 231

2.2 SCDOT Forms: 400.05 (Plant Report), and Plant Worksheets (QA Workbook)
OMR Forms: Worksheet 968; Reports: MD418, MD 420, and MD 421

3. SUMMARY OF TEST METHOD

3.1 Test gradation of extracted aggregates using a dry sieve analysis after ignition testing has been performed.

4. SIGNIFICANCE AND USE

4.1 The purpose of this procedure is to ensure that the gradation of the extracted mixture meets job mix formula (JMF).

5. APPARATUS

5.1 Sieves: Standard sieves with square openings (JMF Specific).

5.2 Balance, of sufficient capacity and accuracy meeting the requirements of AASHTO M 231.

5.3 Misc. Items: Large Pan, Sieve brushes (soft bristle and wire)

5.4 Mechanical shaker (12” Mary-Ann)

6. TEST SPECIMEN

6.1 The sample size used for conducting this test will be the amount of material remaining after an ignition oven test has been performed.

7. PROCEDURE

7.1 Allow ignition oven baskets to cool to room temperature prior to handling to minimize risk of burn injury to the technician. Once the ignition oven baskets containing the aggregate samples have cooled, clean out the baskets and place the aggregates into a tared large sample pan. Use a sieve brush to ensure that all of the fine material is transferred in a tared pan from the ignition oven baskets. Record the sample to the nearest 0.1 gram once the aggregate samples reach a constant weight.

7.2 Invert the pan containing the extracted aggregate into a nested set of sieves corresponding to the required fraction sizes according to the JMF. Brush all fine material from the pan. Shake the sample in a mechanical shaker for a period of 10 ± 1 minutes or as deemed necessary by the calibration of the sieving equipment.

7.3 Invert the nest of sieves by removing the top size sieve and using it as the bottom. Remove the individual sieves and stack them on top of each until the bottom sieve pan is on top. Begin weighing and recording the amount of material contained in each sieve starting with the bottom sieve pan and proceeding cumulatively to the largest sieve containing material. Record the cumulative weight for the entire sample to the nearest 0.1 gram.

8. CALCULATIONS

8.1 Calculate the percentage of material passing each individual sieve as a portion of the entire sample based on total weight prior to sieving. The percent passing should be calculated to the nearest 0.1% with the exception of the No. 200 sieve, which requires calculations to the nearest 0.01%.

Table 1 -shows an example of these calculations.

Sieve Size	Wt. Passing (gms.)	Total % Passing
3/4”	1145.0	100.0
1/2”	1079.3	94.3
3/8”	908.4	79.3
No. 4	646.9	56.5
No. 8	443.3	38.7
No. 30	261.0	22.8
No. 100	136.8	11.9
No. 200	85.1	7.43

Table 1- SC-T-102 – Example mechanical analysis calculations

8.2 Ensure that the sample final sample mass is within +/- 0.2% of the total mass after sieving or the sieve nest or equipment may be suspect.*
Beginning Sample Weight 1145.0 grams

After Sieving Weight = 1144.2 grams
Calculate the mass loss = (0.8 grams / 1145.0 grams) * 100 = 0.07% (Satisfactory)
* *If the final sample mass decreases more than 0.2%; the technician should immediately look at the nest of sieves and sieve shaker for any damage. If final sample mass increases in excess of 0.2%; the technician needs be sure that proper sieve cleanout is being done after each sieve analysis.*

9. REPORT

9.1 Report percent passing values on the required sieves. Field test results are reported on Form 400.05 (Plant Report) and verification results on Form MD418, MD420, MD421 (Lab Reports). Field data and calculations are recorded on daily plant worksheets and on Form # 968 for verification samples.