

SIEVE ANALYSIS OF AGGREGATE FROM ASPHALT MIXING PLANTS

1. SCOPE: This test method describes the procedure for the sieve analysis of aggregate obtained from the hot bins or collector belt of an asphalt mixing plant for informational, process-control, acceptance, or verification testing.
2. EQUIPMENT:
 - 2.1. Balance: Provide a balance or scales having a minimum capacity of 5000 g and a sensitivity of 1 g.
 - 2.2. Sieves: Provide sieves conforming to AASHTO M 92, *Wire-Cloth Sieves for Testing Purposes*.
 - 2.3. Miscellaneous equipment: Provide equipment suitable for sampling, handling, and storing the aggregate (buckets, pans, scoops, small brushes, etc.).
 - 2.4. Sampling devices: Provide a sampling device of adequate size to catch the entire flow of material from the hot-bin openings. When belt samples are utilized, provide suitable templates.

NOTE 1: It shall be the responsibility of the Contractor to furnish personnel to obtain aggregate samples.
3. REPRESENTATIVE SAMPLE: Obtain a sample that is representative of all the aggregate used in the mix. When mineral filler is used, include it in the sieve analysis. Account for collected dust, whether returned or wasted, in the sieve-analysis sample.
4. PROCEDURE:
 - 4.1. Sampling: For continuous-mix plants, sample at the apron feed leading to the pugmill. For batch plants, sample at the point that the material falls into the weigh hopper. For drum-mix plants, sample from the main collector belt or after the aggregate passes through the cold-feed bins. Construct and locate sampling facilities so that the samples can be safely obtained and will be representative of the aggregate incorporated into the mixture.
 - 4.2. Combining samples and testing: Obtain test-portion sizes conforming to Kentucky Method (KM) 64-425, *Sampling Asphalt Mixtures*.
 - 4.2.1. For hot-bin samples, proportionally combine the individual bin samples to the total weight required by Subsection 4.2 of this method.
 - 4.2.2. When using plant recordation for asphalt content acceptance, combine the individual bin samples to the ingredient percentages from the particular batch used for asphalt content determination purposes.

4.2.3. When not automatically recording the aggregate-proportioning information, combine the individual bin samples based on the available data. If the plant has a display screen but does not record the ingredient bin pulls or weights, use the displayed values (converted to percentages) that most nearly represent the material corresponding to the asphalt content determination sample to proportion the total sample. If the system does not display the ingredient bin pulls or weights on a screen or record them on a ticket, proportion the sample based on the theoretical (design) scale settings.

4.3. For drum-mix plants, obtain the aggregate sample as follows:

4.3.1. When sampling the aggregate from the belt of the drum-mix plant, choose a sampling location that provides access to the total, combined ingredient aggregate (after passing through the scalping screen).

4.3.2. When obtaining the individual aggregates after they pass through the cold-feed bins, proportion the composite sample according to the flow rates, displayed on the plant screen, that most nearly represent the material corresponding to the asphalt content determination sample. If the scalping screen removes significant quantities of oversize aggregate, adjust the sample to ensure that it is representative of the aggregate being incorporated into the mixture.

NOTE 2: FOR ALL TYPES OF PLANTS AND FOR ALL SAMPLING SITUATIONS, ENSURE THAT THE SAMPLE IS REPRESENTATIVE OF THE ACTUAL AGGREGATE USED IN THE MIX.

4.4. Corrections or adjustments may be necessary when:

4.4.1. scalping the material;

4.4.2. wasting the collected fines; or

4.4.3. including recycled-asphalt pavement (RAP).

4.5. An example of the calculations for proportioning the composite sample is as follows:

For a 0.38-in.-nominal mixture, obtain a 1500-g sample.

Bin percentages (or cold-feed rates):

Bin # 1 = 39% Bin # 2 = 40% Bin # 3 = 21%

Proportion the composite 1500-g sample as follows:

Bin #1	= 0.39 x 1500 =	585 g
Bin #2	= 0.40 x 1500 =	600 g
Bin #3	= 0.21 x 1500 =	<u>315 g</u>
		1500 g

4.6. Thoroughly mix the individual aggregate samples, and remove representative portions

from each bin or belt sample until obtaining the required weights.

5. TESTING PROCEDURES:

- 5.1. When preliminary testing to establish cold-feed or hot-bin settings or other informational testing is necessary, perform a dry-sieve analysis according to AASHTO T 27, *Sieve Analysis of Fine and Coarse Aggregates*.
- 5.2. When the sieve analysis is for acceptance purposes, perform the testing according to KM 64-433, *Wet-Sieve Analysis of Aggregates Used in Asphalt Mixtures*, or KM 64-620, *Wet Sieve Analysis of Fine and Coarse Aggregate*.

6. REPORT: Report the final gradation result on all sieves, except the No. 200, to the nearest whole number. Report the gradation of the No. 200 sieve to the nearest 0.5 percent. For example, report a result computed to be "3.2" as "3.0", but report a result computed to be "3.3" as "3.5".

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