Designation: D5624 – 13

Standard Practice for Determining the Transverse-Aggregate Spread Rate for Surface Treatment Applications[1]

This standard is issued under the fixed designation D5624; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice details the procedure for determining the aggregate spread rates in approximately 0.33-m transverse increments.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C136 Test Method for Sieve Analysis of Fine and Coarse Aggregates

C566 Test Method for Total Evaporable Moisture Content of Aggregate by Drying

E898 Test Method of Testing Top-Loading, Direct-Reading Laboratory Scales and Balances

3. Summary of Practice

3.1 The transverse-aggregate spread rate is determined by the use of a series of pads laid side by side width-wise across the pavement. The aggregate spreader is then allowed to proceed across the mats with the gates open allowing the aggregate to drop onto the mats. Aggregate collected on each of the mats is removed and weighed. The transverse-aggregate distribution then is calculated, and the aggregate spreader adjusted if desired. Moisture content and aggregate gradation can be determined from the collected material.

4. Significance and Use

4.1 This practice can be used to calibrate aggregate spreaders and verify the uniformity of distribution transversely prior to construction of the surface treatment by determining the average quantity of aggregate spread per unit area.

4.2 This practice can be useful for quality control during construction to monitor the spread rate.

4.3 The samples obtained during construction can also be used for the determination of moisture content and grading when such information is required.

5. Apparatus

5.1 *Balance*—A balance (or scale) of sufficient capacity to handle the mass of the aggregate shall be provided. This balance (or scale) shall be readable and accurate to 1 g if only the transverse spread rate is being determined; an accuracy of 0.1 g is needed if moisture content is being determined. All balances, or scales, shall meet the requirement set forth in Method E898 for top loading, direct-reading laboratory scales and balances.

5.2 *Containers*—Containers, sufficient in number for the number of samples to be taken, and of a sufficient size to hold the contents of one mat. If moisture content is to be determined, then the container shall be sealable.

5.3 *Mats*—Individual flat mats with a known surface area. The material should be able to stay in place as the aggregate spreader moves over the mats in the wheel paths. The material should also have sufficient texture so the aggregate does not roll appreciably when dropped from the aggregate spreader (Note 1).

NOTE 1—Rubber floor mats and roofing felt materials of known dimensions have been used successfully.

5.4 *Oven*—The oven shall be a forced air type oven capable of maintaining a uniform temperature of 110 ± 5°C.

PROCEDURES

6. Determination of Transverse Spread Rate

6.1 Place the mats side by side width-wise on the pavement with the grooves perpendicular to the centerline (Fig. 1). This practice can be used to evaluate the uniformity of the aggregate

[1] This practice is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.24 on Bituminous Surface Treatments.

Current edition approved Dec. 15, 2013. Published January 2014. Originally approved in 1994. Last previous edition approved in 2007 as D5624 – 02 (2007). DOI: 10.1520/D5624-13.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

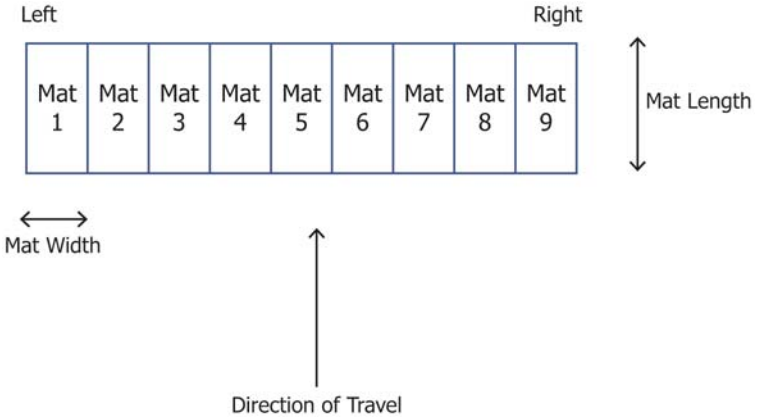

FIG. 1 Layout of Mats

spread rate across the entire width of spreader box, or limited to key areas of interest such as within the wheel paths. Adjustments to the transverse aggregate spread rate are more easily made when the width of the individual mats are matched to the width of the individual gates on the aggregate spreader.

NOTE 2—Gate widths may vary across the aggregate speader box and by equipment manufacturer.

6.2 Drive the aggregate spreader over the pads with the gates open to allow the aggregate to fall onto the mats. The aggregate spreader should be operating at the desired speed and aggregate spread rate before reaching the mats.

6.3 After the aggregate spreader has passed over the mats, carefully brush the aggregate away from the mat edges toward the center of each mat, recover the aggregate from each mat, and determine the mass of aggregates retained on each mat. Record the mass of retained aggregate and the transverse location of each mat.

6.4 Record the mass retained on each mat in a manner which represents the actual mass across the width of the roadway following the format shown in Fig. 1.

6.5 Use this comparison of the incremental transverse spread rates to identify aggregate spreader gates which applied too little or too much aggregate. Adjust these gates to increase or decrease the application rate and repeat the procedure until the desired results are obtained (Note 3).

NOTE 3—The ability to increase or decrease the spread rate can vary by equipment design, condition as well as the type of material being placed.

7. Moisture Content of Aggregate (Optional)

7.1 When the moisture content of the aggregate at the time of construction is desired, place the aggregate in a sealed container within 5 min of spreading the aggregate. The average moisture content of the aggregate can be determined by combining the aggregate from all of the mats into a single container.

7.2 Determine the moisture content of the aggregate in accordance with Test Method C566.

8. Aggregate Gradation (Optional)

8.1 The aggregate sample used for determining the moisture content can also be used to determine the gradation using Test Method C136.

9. Generic Calculations

9.1 The transverse spread rate, per mat, is obtained by determining the individual aggregate retained on each mat:

$$S = \frac{(A - B)}{LW} \quad (1)$$

where:

A = mass of aggregate and container,
B = mass of container,
L = length of mat,
S = aggregate spread rate in units of mass per mat area, and
W = width of mat.

10. Report

10.1 Report the following information:

10.2 Moisture content of aggregate, if determined,

10.3 Aggregate gradation, if determined, and whether the aggregate was pre-coated, pre-wet or dry, and

10.4 The aggregate spread rate quantity mass per individual mat area. Report results from left to right from the driver's perspective.

11. Keywords

11.1 aggregate spread rate; surface treatment