Designation: F762/F762M – 08 (Reapproved 2014)

Standard Test Method for Determining Change in Groove (or Void) Depth With Distance Traveled for Passenger Car Tires[1]

This standard is issued under the fixed designation F762/F762M; 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 test method covers a procedure to be used to obtain data for determining the changes in tire tread depth over any specified course and test period.

1.2 The tire tread depth loss data obtained according to the procedures for this test method may be used to calculate tire tread wear by way of the procedures described in Practice F1016.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.4 *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]

F421 Test Method for Measuring Groove and Void Depth in Passenger Car Tires

F457 Test Method for Speed and Distance Calibration of Fifth Wheel Equipped With Either Analog or Digital Instrumentation

F538 Terminology Relating to the Characteristics and Performance of Tires

F1016 Practice for Linear Tire Treadwear Data Analysis

F1502 Test Method for Static Measurements on Tires for Passenger Cars, Light Trucks, and Medium Duty Vehicles

3. Terminology

3.1 *Definitions:*

3.1.1 *break-in, n*—one or more periods of initial standardized tire operation during which tire is brought to the state which will lead to more consistent test results. **F538**

3.1.2 *element, n*—an isolated (totally bounded by void) projection. **F538**

3.1.3 *groove, n*—a void that is relatively narrow compared to its length. **F538**

3.1.4 *groove (void) average depth, n*—the average depth of all groove depth measurements in a single groove. **F538**

3.1.5 *groove (void) depth, [L], n*—a measurement of the perpendicular distance from a real or calculated reference plane defined by edges of two adjacent ribs or elements to the lowest point of contact in the groove (void). **F538**

3.1.6 *irregular wear, n*—a type of treadwear characterized by substantial variations of tread loss both from projection to projection and frequently from point to point on a given projection. **F538**

3.1.7 *measurement interval, n*—the distance travelled, in kilometres [miles], between two successive groove (void) depth measurements. **F538**

3.1.7.1 *Discussion*—A specified number of test cycles will constitute a measurement interval. If a tire rotation plan is specified, the measurement interval shall include equal distance on each specified wheel position for each tire test specimen. More frequent measurements may be made if desired. The number of measurement intervals should be compatible with the tire rotation plan to result in a logical basis for data interpretation.

3.1.8 *projection, n*—a pavement contacting area of the tread band, bounded by void. **F538**

3.1.9 *rib, n*—a continuous circumferential projection. **F538**

3.1.10 *rotation plan, n— in tire testing*, the scheduled change of wheel positions for all tires on a vehicle, and between vehicles in a convoy, and scheduled change of vehicle position in a convoy during a road test as appropriate. **F538**

3.1.10.1 *Discussion*—Test tires should occupy each position on the vehicle for the same number of cycles. A tire rotation

[1] This test method is under the jurisdiction of ASTM Committee F09 on Tires and is the direct responsibility of Subcommittee F09.30 on Laboratory (Non-Vehicular) Testing.

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[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.

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plan may be designed for each test in accordance with the requirement of the test program.

3.1.11 *test cycle, n—in tire testing*, one complete circuit of the specified test course. F538

3.1.12 *tread depth average, n— in a single tire*, the average of all tire groove (void) depth measurements.

3.1.13 *void, n*—a volume (in the tread band) defined by the lack of rubber; the depth dimension of the volume may vary from point to point in (on) the tread band. F538

4. Summary of Test Method

4.1 The tire test procedure is carried out by repeatedly driving one or more test vehicles over a specified test course. All tires on each test vehicle are of the same tire size designation: duplicate tires are mounted on each axle. A break-in period prior to the measurement program is optional. The tires may be rotated among wheel positions after completion of a specified number of runs over the test course. Drivers maintain the same position in the convoy; the vehicle's position in the convoy is rotated uniformly.

4.2 The test consists of a predetermined number of road testing cycles. Groove (void) depth measurements are made after completion of a specified number of test cycles.

4.3 The wear rate may by calculated in a number of ways (see Practice F1016).

5. Significance and Use

5.1 The test data obtained with this test method may be used to compare the performance of various tires for the conditions under which they were tested.

5.2 This test method is suitable for a variety of quality assurance, research, and development purposes, when tires are to be compared during a single series of tests. *The procedure described may not be suitable for regulatory statutes or specification acceptance because the values obtained may not agree, or correlate either in rank order or absolute tread wear performance level, with values obtained on other road surfaces, or on the same surface after additional wear, under other environmental conditions, on other test vehicles, or with results obtained by other test procedures.*

6. Interferences

6.1 Vehicles of different types can influence test results. When involved in comparison testing, avoid mixing of vehicles with significantly different drivelines or suspensions.

7. Apparatus

7.1 *Test Vehicle*—Any vehicle compatible with test load and tire dimensions.

7.2 *Rims,* of design rim width + 0.5, – 0.0 in. for the test tire as recommended by the Tire and Rim Association (T&RA)[3] or other standard tire and rim organizing bodies.

7.3 *Speed Recording Equipment,* to record speed history as a function of time, accurate to ±2 %.

7.4 *Distance Recording Equipment,* to accumulate the total test distance, accurate to ±2 %.

7.5 *Vehicle Weighing Device.*

7.6 *Vehicle Wheel Alignment Equipment* (front wheel and, where applicable, rear wheel).

7.7 *Tire Pressure Gage.*

7.8 *Groove (or Void) Measurement Device (Depth Gage)* meeting the specifications of the American Gage Design Committee and Test Method F421.

7.9 *Tread Hardness Gage.*

8. Test Course

8.1 The test course is any network of public or private roads, or both. A speed schedule shall be defined as well as reasonable number of defined and scheduled stops and starts.

9. Safety Precautions

9.1 All normal traffic safety precautions must be observed and appropriate vehicle spacing maintained. Posted and procedural speed limits must be observed. Vehicle spacing should be at least one car length for each 15 km/h [10 mph] speed plus three car lengths.

9.2 All safety related mechanical and electrical systems of the vehicle must be in good operating condition for the test.

9.3 Refer to RMA Demounting and Mounting Procedures for Automobile Tires[4] for additional safety warnings.

10. Sampling

10.1 A sample is set of *n* sampling units obtained from the population being sampled. For example, the population may be a portion of a dealer's stock or a single lot from a manufacturer.

10.2 A sampling unit is a minimum of two duplicate tires.

10.3 The test specimen is a single tire of a sampling unit.

11. Selection and Preparation of Test Tires

11.1 All test tires shall be approximately the same age and shall have been stored under the same conditions (unless age or storage effects are the factors being studied).

11.2 Mount test tires on rims in compliance with T&RA or other standard tire and rim organizing bodies using conventional mounting procedure approved by RMA.

11.2.1 Inflate the tire at ambient temperature to the specified test pressure, which shall not exceed the maximum inflation pressure molded on the tire, unless the experiment requires it, for example, if inflation effects are being studied.

11.2.2 Balance the tire and wheel assembly.

11.2.3 If, prior to starting the test, pressure loss is noted, determine and eliminate the cause and adjust the inflation pressure.

[3] Available from Tire and Rim Association, Inc., 175 Montrose West Ave., Copley, OH 44321.

[4] Available from Rubber Manufacturers Association, 1400 K St., NW, Washington, DC 20005.

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