



Designation: ~~F2870 – 11~~ **F2870 – 16**

Standard Specification for 315/70R22.5 154/150L Radial Truck Standard Reference Test Tire¹

This standard is issued under the fixed designation F2870; 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 specification covers the general requirements for the 315/70R22.5 154/150L radial truck standard reference test tire. The tire covered by this specification is primarily for use as a reference tire for braking traction, snow traction, and wear performance evaluations, but may also be used for other evaluations, such as pavement roughness, noise, or other tests that require a reference tire.

1.1.1 Other standard reference test tires are also used for these purposes and are referenced in Section 2.

1.2 This specification provides a 22.5 rim diameter code standard truck tire design and construction, standard dimensions, and specifies the conditions of storage.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered 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

[D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension](#)

~~[D2240 Test Method for Rubber Property—Durometer Hardness](#)~~

[D3182 Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets](#)

[E867 Terminology Relating to Vehicle-Pavement Systems](#)

[E1136 Specification for P195/75R14 Radial Standard Reference Test Tire](#)

[F538 Terminology Relating to the Characteristics and Performance of Tires](#)

[F2493 Specification for P225/60R16 97S Radial Standard Reference Test Tire](#)

[F2871 Specification for 245/70R19.5 136/134M Radial Truck Standard Reference Test Tire](#)

[F2872 Specification for 225/75R16C 116/114S M+S Radial Light Truck Standard Reference Test Tire](#)

2.2 *ISO Standards:*³

[ISO 868 Plastics and ebonite – Determination of indentation hardness by means of a durometer \(Shore hardness\)](#)

[ISO 21509 Plastics and Ebonite – Verification of Shore durometers](#)

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this specification, refer to Terminology [F538](#).

3.1.2 *pavement characteristic, n*—physical feature or property of a pavement surface such as type, roughness, texture, and skid resistance. **E867**

¹ This specification is under the jurisdiction of ASTM Committee [F09](#) on Tires and is the direct responsibility of Subcommittee [F09.20](#) on Vehicular Testing. Current edition approved Jan. 1, 2011; Nov. 1, 2016. Published March 2011; November 2016. Originally approved in 2011. Last previous edition approved in 2011 as F2870 – 11. DOI: [10.1520/F2870-11-10.1520/F2870-16](#).

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.

³ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, [http://www.iso.org](#).

3.1.3 *pitch, n*—unit of tread pattern elements used in various combinations to obtain optimum noise levels. **F538**

3.1.4 *standard reference test tire, SRTT, n*—tire that is used as a control tire or surface-monitoring tire (for example, Specifications E1136, F2493, F2870, F2871, and F2872). **F538**

4. Design and Construction

4.1 The 315/70R22.5 154/150L standard reference test tire shall feature the steel-belted radial technology, and a smooth-ribbed tread design, see Fig. 1 and Fig. 2, with technology as described in Sections 5 – 7.

4.2 The tire shall be designed to conform to the European Tyre and Rim Technical Organisation (ETRTO) dimensions and tolerances for cross section and overall diameter found in the current ETRTO Standards Manual.⁴

4.3 The tire used for this specification is produced by Manufacture Francaise des Pneumatiques Michelin.⁵ The tire is stamped on the sidewall with the words: “Standard Reference Test Tire” and “F2870”.

5. Materials and Manufacture

5.1 The individual standard reference test tires shall conform to the manufacturer’s design standards.

5.2 Tread compound, fabric processing, and all the steps in tire manufacturing shall be controlled to ensure minimum variability between tires.

5.3 The standard reference test tire shall be as originally molded without any tread grinding or repairs.

5.4 Since the formulation for tread compounds are proprietary, they shall be controlled by means of their physical properties given in Table 1.

5.5 Dimensions, weights, and permissible variations are given in Section 7.

5.6 The tire shall be of the following construction:

5.6.1 One-ply sidewall construction (steel).

5.6.2 A five-ply tread construction (one-ply steel and four steel belts).

5.6.3 Black sidewall.

6. Physical Properties

6.1 The physical properties of the tread compound are listed in Table 1.

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⁴ Available from the European Tyre and Rim Technical Organisation 32/2, avenue Brugmann 78/80, rue Defacqz – B-1060 Brussels Belgium.

⁵ The sole source of supply of the apparatus known to the committee at this time is Manufacture Francaise des Pneumatiques Michelin CERL Ladoux, 23 place des Carmes Dechaux, 6304 Clermont-Ferrand Cedex 09, France (attn. F43 Magasin – specify 315/70R22.5 154/150L Michelin truck SRTT). If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.



FIG. 1 Front View of the 315/70R22.5 154/150L Radial Truck Standard Reference Test Tire



FIG. 2 Side View of the 315/70R22.5 154/150L Radial Truck Standard Reference Test Tire

TABLE 1 Physical Properties of Tread Compound

Tensile sheet cure, min at 160°C (320°F)	15.0 min
Stress at 300 % elongation, MPa (psi)	11.0 ± 1.0 MPa (1595 ± 145 psi)
Stress at 300 % elongation, MPa (psi)	11.0 ± 2.0 MPa (1595 ± 290 psi)
Tensile strength, min MPa (psi)	15.5 MPa (2250 psi) min
Elongation, min %	450 % min
Durometer hardness ^A	65 ± 2 Type A
Durometer hardness ^A	66 ± 2 Type A

^A Measured on tire tread.

7. Dimensions, Weights, and Permissible Variations

7.1 Details of dimensions are listed as follows and are shown in Fig. 3. When tolerances are not specified, tire dimensions are subject to manufacturer's normal tolerances.

7.2 *Inflated Dimensions and Cured Cord Angles at 900 kPa (130 psi):*

7.2.1 The tread width shall be 259 mm (10.2 in.), and the cross-sectional tread radius shall be 1100 mm (43.3 in.) on the center and 650 mm (25.6 in.) on the shoulders.

7.2.2 The tread radius is measured using a reference radius template as shown in Fig. 4.

7.2.3 The tire shall have an overall section width of 315.8 mm (12.43 in.), and an outside diameter of 1009 mm (39.72 in.) when mounted on a measuring rim (22.5x 9.00).

7.2.4 The cured cord angles shall be 90 ± 8° for the carcass and 65 ± 4° for belt 1 and 18 ± 4° for belts 2, 3, and 4.

7.3 *Ribs*—The tire shall have five ribs.

7.4 *Grooves*—The tire shall have four circumferential grooves having a minimum tread depth of 10.6 mm (0.417 in.).

7.5 *Tread Design:*

7.5.1 *Groove (Void) Area Fraction*—19.0 %.

7.5.2 *Number of Pitches*—84.

7.5.3 *Footprint Size*—212.5 mm long by 259.2 mm wide (8.37 by 10.22 in.) at 3679 kg (8110 lb) at 900 kPa (130 psi).

7.6 *Tread Wear Indicators*—The tire shall have indicators in each groove, laterally across the tread width, in at least six locations spaced uniformly around the tire circumference. The height of the wear indicators in the grooves shall be 1.6 mm (0.063 in.), – 0.00 mm, + 0.60 mm.

NOTE 1—Tread depth is not to be measured at these wear indicators.

8. Workmanship

8.1 Tires shall be free of defects in workmanship and material.

9. Test Methods

9.1 Preparation of tensile sheet cure shall be in accordance with Practice D3182.

9.2 Stress at 300 % elongation shall be in accordance with Test Methods D412.

9.3 Tensile strength shall be in accordance with Test Methods D412.

9.4 Elongation shall be in accordance with Test Methods D412.