



Designation: D 4975 – 02

## Standard Test Methods for Single-Filament Tire Bead Wire Made from Steel<sup>1</sup>

This standard is issued under the fixed designation D 4975; 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 These test methods cover testing of single-filament steel wires that are components of tire beads used in the manufacture of pneumatic tires. By agreement, these test methods may be applied to similar filaments used for reinforcing other rubber products.

1.2 These test methods describe test procedures only and do not establish specifications and tolerances.

1.3 This standard is written in SI units. No other units of measurement are included in this standard.

1.4 These test methods cover the determination of the mechanical properties listed below:

1.5 *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.*

| Property                  | Section |
|---------------------------|---------|
| Breaking Force (Strength) | 7-13    |
| Yield Strength            | 7-13    |
| Elongation                | 7-13    |
| Torsion Resistance        | 14-20   |
| Diameter (Gage)           | 21-27   |

### 2. Referenced Documents

#### 2.1 ASTM Standards:

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products<sup>2</sup>

D 76 Specification for Tensile Testing Machines for Textiles<sup>3</sup>

D 123 Terminology Relating to Textiles<sup>3</sup>

D 2969 Test Method for Steel Tire Cords<sup>3</sup>

D 6477 Terminology Relating to Tire Cord and Fabrics<sup>4</sup>

E 6 Terminology Relating to Methods of Mechanical Testing<sup>5</sup>

E 558 Test Method for Torsion Testing of Wire<sup>5</sup>

### 3. Terminology

#### 3.1 Definitions:

3.1.1 For definitions of terms relating to tire cord and fabrics, refer to Terminology D 6477.

3.1.2 For definitions of other textile terms, refer to Terminology D 123.

### 4. Summary of Test Methods

4.1 A summary of the procedures prescribed for the determination of specific properties of tire bead wire is stated in the appropriate sections of the specific test methods that follow.

### 5. Significance and Use

5.1 The procedures for the determination of properties of single-filament bead wire made from steel are considered satisfactory for acceptance testing of commercial shipments of this product because the procedures are the best available and have been used extensively in the trade.

5.1.1 If there are differences of practical significance between reported test results for two laboratories (or more), comparative tests should be performed to determine if there is a statistical bias between them, using competent statistical assistance. As a minimum, test samples should be used that are as homogeneous as possible, that are drawn from the material from which the disparate test results were obtained, and that are randomly assigned in equal numbers to each laboratory for testing. Other materials with established test values may be used for this purpose. The test results from the two laboratories should be compared using a statistical test for unpaired data, at a probability level chosen prior to the testing series. If a bias is found, either its cause must be found and corrected, or future test results for that material must be adjusted in consideration of the known bias.

### 6. Sampling

6.1 *Lot Sample*—As a lot sample for acceptance testing, take at random the number of reels, coils, spools, or other shipping units of wire directed in an applicable material specification or other agreement between the purchaser and the supplier. Consider reels, coils, spools, or other shipping units of wire to be the primary sampling units.

NOTE 1—A realistic specification or other agreement between the purchaser and the supplier requires taking into account the variability between and within primary sampling units so as to provide a sampling

<sup>1</sup> These test methods are under the jurisdiction of ASTM Committee D13 on Textiles and are the direct responsibility of Subcommittee D13.19 on Tire Cord and Fabrics.

Current edition approved April 10, 2002. Published June 2002. Originally published as D 4975 – 89. Last previous edition D 4975 – 96a.

<sup>2</sup> Annual Book of ASTM Standards, Vol 01.03.

<sup>3</sup> Annual Book of ASTM Standards, Vol 07.01.

<sup>4</sup> Annual Book of ASTM Standards, Vol 07.02.

<sup>5</sup> Annual Book of ASTM Standards, Vol 03.01.