



Standard Test Methods for Electrical Performance Properties of Insulations and Jackets for Telecommunications Wire and Cable¹

This standard is issued under the fixed designation D 4566; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 These test methods cover procedures for electrical testing of thermoplastic insulations and jackets used on telecommunications wire and cable and for the testing of electrical characteristics of completed products. To determine the procedure to be used on the particular insulation or jacket compound, or on the end product, reference should be made to the specification for that product.

1.2 The test methods appear in the following sections of this standard:

Test Method	Sections
Electrical Tests of Insulation—In Process:	4-8
D-C proof test	8
Insulation defect or fault rate	7
Spark test	6
Electrical Tests of Completed Wire and Cable:	9-37
Attenuation	26
Capacitance deviation	19
Capacitance difference	20
Capacitance unbalance—pair-to-ground	22
Capacitance unbalance—pair-to-pair	21
Capacitance unbalance—pair-to-support wire	23
Characteristic impedance—Method 1	42
Characteristic impedance—Method 2, Options 1 and 2	43
Characteristic impedance—Method 3	44
Coaxial capacitance (capacitance to water)	17
Conductor continuity	11
Conductor resistance	13
Conductor resistance unbalance (pairs)	15
Continuity of other metallic cable elements	12
Crosses test (continuity between wires of different pair)	30
Crosstalk loss—far end	25
Crosstalk loss—near end	24
DC proof test—core-to-internal shield (screen)	35
DC proof test—core-to-shield	33
DC proof test—core-to-support wire	34
DC proof test—internal shield (screen)-to-shield	36
DC proof test—other required isolations	37
DC proof test—wire-to-wire	32
Fault rate test (air core only)	28
Insulation resistance	27
Jacket voltage breakdown rating test	31
Mutual capacitance	18
Mutual conductance	16
Phase constant	39

Phase delay	40
Phase velocity	41
Resistance of other metallic cable elements	14
Shorts test (continuity between wires of a pair)	29
Structural Return Loss	45
Voltage surge test	38

1.3 The values stated in inch-pound units are to be regarded as the standard. SI units are for information only.

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. Specific hazard statements are given in Sections 6 and 32.*

2. Referenced Documents

2.1 ASTM Standards:

B 193 Test Method for Resistivity of Electrical Conductor Materials²

D 150 Test Methods for A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials³

D 1711 Terminology Relating to Electrical Insulation³

D 3426 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials Using Impulse Waves⁴

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁵

2.2 ANSI Standard:

ANSI/IEEE Standard 100 IEEE Standard Dictionary of Electrical and Electronics Terms⁶

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *air core, n*—refers to products in which the air spaces between cable core components (pairs, etc.) remain in their unfilled or natural state.

¹ These test methods are under the jurisdiction of ASTM Committee D-9 on Electrical and Electronic Insulating Materials and are the direct responsibility of Subcommittee D09.18 on Solid Insulations, Non-Metallic Shieldings, and Coverings for Electrical and Telecommunications Wires and Cables.

Current edition approved Dec. 10, 1998. Published March 1999. Originally published as D 4566 – 86. Last previous edition D 4566 – 94.

² *Annual Book of ASTM Standards*, Vol 02.03.

³ *Annual Book of ASTM Standards*, Vol 10.01.

⁴ *Annual Book of ASTM Standards*, Vol 10.02.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.

⁶ Available from the Institute of Electrical and Electronic Engineers, Inc., 345 E. 47th St., New York, NY 10017.