

STANDARD FOR
BROADBAND BURIED SERVICE WIRE,
FILLED, POLYOLEFIN INSULATED, COPPER CONDUCTOR
TECHNICAL REQUIREMENTS

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INSULATED CABLE ENGINEERS ASSOCIATION, INC.

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The user of this Standard is cautioned to observe any applicable health or safety regulations and rules relative to the manufacture and use of service wires made in conformity with this Standard. This Standard hereafter assumes that the manufacture, testing, installation, and maintenance of service wires defined by this Standard will be performed only by properly trained personnel using suitable equipment and employing appropriate safety precautions.

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ACRONYMS, ABBREVIATIONS AND SYMBOLS (Used in this Standard)

A	-	ampere, apparent absorption coefficient or cross sectional area
ac	-	alternating current
ANSI	-	American National Standards Institute
ASTM	-	American Society for Testing and Materials
ATG	-	absorbent thixotropic gel
AWG	-	American Wire Gauge
BB-BSW	-	broadband buried service wire
CAS	-	Chemical Abstract Service
Cg	-	ground component of mutual capacitance
cm	-	centimeter
CUPP	-	capacitance unbalance pair to pair
dB	-	decibel
dc	-	direct current
ECCS	-	electrolytic chrome coated steel
EIA	-	Electronics Industries Alliance
ETPR	-	extended thermoplastic rubber
F	-	constant representing a specific frequency
f	-	variable representing any frequency in the applicable range
ELFEXT	-	equal level far end crosstalk
FEXT	-	far end crosstalk
ft	-	foot, feet
g	-	gram
Hz	-	Hertz
ICEA	-	Insulated Cable Engineers Association
in	-	inch
IOFEXT	-	input to output far end crosstalk
ISO	-	International Organization for Standardization
k1, k2, k3	-	coefficients for calculating attenuation
kft	-	kilofoot
kHz	-	kilo-Hertz
km	-	kilometer
kV	-	kilovolt
L	-	length of wire for which electrical results are reported
l	-	path length of glass cell
lbf	-	pound-force
lm	-	length of wire for which electrical measurements have been made
m	-	meter or index for "measured"
Mb	-	megabit
mg	-	milligram
MHz	-	mega-Hertz
mil	-	thousandths of an inch
ml	-	milliliter
mm	-	millimeter

ACRONYMS, ABBREVIATIONS AND SYMBOLS (cont.)
(Used in this Standard)

MO	-	manufacturers option
MPa	-	mega-Pascal
MΩ	-	meg Ohm
N	-	Newton or number of pairs in wire
NEC	-	National Electrical Code
NESC	-	National Electrical Safety Code
NEXT	-	near end crosstalk
nF	-	nanofarad
NFPA	-	National Fire Protection Association
NID	-	network interface device
nsec	-	nanosecond
oz	-	ounce
PEPJ	-	polyethylene/petroleum jelly
pF	-	picofarad
psi	-	pounds per square inch
PVC	-	polyvinyl chloride
rms	-	root-mean-square value
s	-	second
SI	-	International System of Units
T	-	temperature or percent transmission at a specific wavelength
THF	-	tetrahydrofuran
TIA	-	Telecommunications Industry Association
UL	-	Underwriters Laboratories
Vs	-	volume of stirring bar
W	-	weight of sample
yd	-	yard
°C	-	degree Celsius
°F	-	degree Fahrenheit
α	-	attenuation per unit length
ρ	-	density
Ω	-	Ohm
%	-	percent

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**STANDARD FOR
BROADBAND BURIED SERVICE WIRE
FILLED, POLYOLEFIN INSULATED, COPPER CONDUCTOR**

TECHNICAL REQUIREMENTS

SECTION 1 GENERAL

- 1.1 **PURPOSE:** The purpose of this Standard is to establish generic technical requirements that may be referenced by individual telecommunications wire specifications covering products intended to connect the broadband outside plant to the individual customer premises. The parameters covered provide material, construction, and performance requirements.

Because this Standard does not cover all details of individual wire design, it cannot be used as a single document for procurement of product. It is intended to be used in conjunction with an individual product specification that provides complete design details for the specific wire type and designates the applicable performance requirements. Such individual wire specifications may be prepared either by the user or the manufacturer. The specification designated for procurement is at the option of the user.

The manufacturer and user of these wires should consider the selection and availability of appropriate hardware in the installation of these products

- 1.2 **SCOPE:** This Standard covers material, mechanical and electrical requirements for Broadband Buried Service Wire (BB-BSW) of ≤ 6 pair, intended for use principally in extending a circuit from a broadband cable terminal to a subscriber's network interface device (NID).
- 1.3 **OPTIONS AND INFORMATION:** This Standard provides alternative choices for type of insulation, type of filling compound, sheath design (shielding materials, single or double jackets, and jacket type and thickness) and armoring.

One objective of this Standard is to ensure compatibility with the Category 5e system requirements (except Delay, see 7.11.1) as specified in the TIA/EIA Standard 568-B.2 for commercial building telecommunications cabling, so that the standardized service wires can be used in a "Customer Owned Outside Plant" or as "Campus Cables", provided they have an appropriate pair count.

Broadband buried service wires as described in this Standard are primarily intended to connect the customer premises to a buried broadband outside or distribution plant. As such, this Standard is a complement to the ICEA S-99-689 standard.

This Standard is arranged in Sections covering specific areas of wire requirements and may be referenced as complete Sections or as individual paragraphs.

Sections of this specification where the user may specify a particular option are listed below:

- 2.1 Conductor Size (AWG)
- 3.2 Insulation Type
- 4.4.2 Filling Compound Type
- 4.5 Flooding Compound
- 4.7 Rip Cord(s)
- 5.1 Shielding System
- 6.1 Inner Jacket
- 6.2.1 Outer Jacket (Raw Material)
- 6.3 Armoring Systems
- 7.20 Shield Heating Test
- 7.21 Fusing Coordination Test
- 8.6 Flammability
- 9.1 Identification and Marking
- 9.3 Packaging

To assist the user in the selection of products and to avoid possible misunderstandings between the manufacturer and user, it is suggested that a check-off sheet similar to that shown in Informative Annex A be utilized.

- 1.4 UNITS AND TOLERANCES: SI units are specified throughout this Standard except for conductor size. Approximate US equivalents and Fahrenheit temperatures are provided for information only. Unless otherwise specified, the rounding-off method of ASTM E 29 shall be used for determining conformance with requirements.
- 1.5 REFERENCES: All documents referenced herein shall be as listed in Table I with issues and/or dates as indicated.
- 1.6 QUALITY ASSURANCE: It is the responsibility of the manufacturer to establish a quality assurance system consistent with ISO Q9001 or an alternate system acceptable to the user. When the user requires a specific quality assurance program and/or special testing procedures, agreement between the user and the manufacturer should be reached before the order is placed.

Requirements provided in this Standard are of two types, qualification and product performance. Qualification requirements are intended to be proof of adequate design and processing and shall be repeated as needed for verification. Product performance requirements are those that shall be met by every length of delivered wire as assured by quality control methods. The following tests shall be performed on all reels of completed wire. The term "completed wire" refers to a continuous length of finished wire resulting from the last jacketing operation.

Properties that shall be tested on 100 percent of the wire lengths produced are listed below by paragraph number:

- 6.1.2 Inner Jacket Thickness Requirements
- 6.2.2 Outer Jacket Thickness Requirements

- 7.17 Conductor-to-Conductor DC Proof Test
- 7.18 Core-to-Shield DC Proof Test
- 7.22 Continuity of Metallic Wire Elements

- 1.7 SAFETY CONSIDERATIONS: Materials in the wire shall comply with industry standards and applicable federal, state, or local laws and regulations.

The user of this Standard is cautioned to observe any applicable health or safety regulations and rules relative to the manufacture and use of wire made in conformity with this Standard. This Standard hereafter assumes that manufacture, testing, installation, and maintenance of wires defined by this Standard will be performed only by properly trained personnel using suitable equipment and employing appropriate safety precautions.