

**ICEA STANDARD FOR
AERIAL SERVICE WIRE**

TECHNICAL REQUIREMENTS

Published by
Insulated Cable Engineers Association, Inc.
Post Office Box 1568
Carrollton, GA 30112, U.S.A.

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Approved July 20, 2011 by
Insulated Cable Engineers Association, Inc.

Approved January 17, 2012 by
American National Standard Institute, 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 cable made in conformity with this Standard. This Standard hereafter assumes that the manufacture, testing, installation, and maintenance of cables 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	-	cross sectional area or apparent absorption coefficient
a	-	cross sectional area
ac	-	alternating current
ANSI	-	American National Standards Institute
ASTM	-	American Society for Testing and Materials
ASW	-	Aerial Service Wire
AWG	-	American Wire Gauge
CCSR	-	Copper Coated Steel Reinforced
CUPP	-	capacitance unbalance pair to pair
dc	-	direct current
EIA	-	Electronics Industries Alliance
ELFEXT	-	Equal Level Far End Crosstalk
FEXT -	-	Far End Crosstalk
ft	-	foot
hrs	-	hours
HV	-	Vickers hardness
ICEA	-	Insulated Cable Engineers Association
ISO	-	International Organization for Standardization
kft	-	kilofoot
kV	-	kilovolt
L	-	length of wire or cable for which electrical results are reported
l	-	path length of glass cell or liter
lbf	-	pound-force
l_m	-	length of wire or cable for which electrical measurements have been made
m	-	index for "measured"
MO	-	manufacturers option
MR	-	metallic reinforced
NEXT	-	Near End Crosstalk
NFPA 70	-	National Electrical Code (NEC)
NID	-	Network Interface Device
NIST	-	National Institute of Standards and Technology
NMR	-	non metallic reinforced
OIT	-	oxidative induction time
oz	-	ounce
psi	-	pounds per square inch
PVC	-	polyvinyl chloride
SI	-	International System of Units
T	-	temperature or percent transmission at a specific wavelength
THF	-	tetrahydrofuran
UL	-	Underwriters Laboratories
V_s	-	volume of stirring bar
W	-	weight of sample
yd	-	yard
°C	-	degree Celsius

ACRONYMS, ABBREVIATIONS AND SYMBOLS
(Used in this Standard)

°F	-	degree Fahrenheit
α	-	attenuation in dB/unit length
ρ	-	density
Ω	-	Ohm
°	-	degree
%	-	percent

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ICEA STANDARD FOR AERIAL SERVICE WIRE 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 for normal outside plant use. 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 Aerial Service Wire (ASW) intended for use principally in extending a telephone circuit from a distribution cable terminal to a subscriber's station protector or network interface device (NID).

- 1.3 **OPTIONS AND INFORMATION:** This Standard is arranged in sections covering specific areas of wire requirements and may be referenced as complete sections or as individual paragraphs.

Two types of electrical performance levels, with respect to mutual capacitance and attenuation, are specified, i.e. **Type 1** and **Type 2**.

Aerial Service Wire is intended to be self-supporting and shall contain strength members to accommodate the appropriate requirements of this standard. The self-supporting properties may be accomplished by utilizing copper coated steel conductors, a galvanized coated steel strength member or an integral or multiple layer(s) of approved compounds containing synthetic reinforcing members. There are two classes of wires with synthetic reinforcing members, i.e. Class A and Class B. Class A has decreased elongation and residual elongation allowance compared to Class B, which is beneficial for longer spans and in heavy loading areas. Table 1-1 lists the different wire designations and constructions used throughout this document.

Table 1-1 - Wire Designations and Constructions

Wire Designations	Strength Members	Wire Construction
CCSR Copper Coated Steel Reinforced	Conductor	Two parallel copper coated steel conductors
NMR Non Metallic Reinforced	Non-Metallic Members	Parallel twisted pair or star quad
MR Metallic Reinforced	Metallic Support Messenger	Twisted pair

Paragraph numbers of this Standard where the user may specify a particular option are listed below, with the indication of the option to be selected:

- 4.1 Construction and Color Code (NMR and MR)
- 4.2.2 Core wrap of MR construction
- 4.3 Ripcords
- 4.3.3 Cold weather jacket slitting
- 5.2 Diameter of MR strength member
- 6.1 Shielding System
- 8.1.8 Fusing Coordination
- 8.2 **Type 1** or **Type 2** electrical performance with respect to mutual capacitance and attenuation
 - 8.2.11 Fusing Coordination
- 9.1.7 Class A or Class B elongation and residual elongation performance
- 10.1 Wire identification
 - 10.1.5 Length markings (ft./m)
- 10.2 Package of wire

To assist the user in selection of options and to avoid possible misunderstandings between 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 (see NIST-SP 811) are specified throughout this Standard except for conductor size. Approximate U.S. equivalents and Fahrenheit temperatures are provided for information only. The rounding-off method of ASTM E 29 shall be used for determining measurement tolerances.
- 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 which shall be met by every length of delivered wire as assured by either quality control methods or by 100% testing 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:

- 3.2.4.6 Insulation Imperfections (NMR)
- 3.3.4.6 Insulation Imperfections (MR)
- 8.1.1 Continuity and Shorts (CCSR)
- 8.1.9 Insulation Imperfections (CCSR)
- 8.2.1 Continuity and Shorts (NMR and MR)
- 8.2.10 Dielectric Strength (NMR and MR)

As an exception to these requirements for products packaged in-line, these tests may be performed at the last assembly operation prior to jacketing.

The requirements to be considered for qualification are so designated within this Standard. The remaining tests are product performance tests.

- 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.