



NEUTRAL-SUPPORTED POWER CABLE ASSEMBLIES
WITH
WEATHER-RESISTANT EXTRUDED INSULATION
RATED 600 VOLTS

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INSULATED CABLE ENGINEERS ASSOCIATION, Inc.

STANDARD FOR
NEUTRAL-SUPPORTED POWER CABLE ASSEMBLIES
WITH
WEATHER-RESISTANT EXTRUDED INSULATION
RATED 600 VOLTS

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Part 1

GENERAL

1.1 SCOPE

This standard applies to the materials, constructions, and testing of assemblies of extruded dielectric insulated electric current carrying phase conductors and bare or covered neutral electrical conductors used as weather-resistant wires and cables suspended from supporting structures for the overhead distribution of electrical energy.

This standard is intended to apply to the following multiplexed wire and cable constructions:

Neutral Supported Service Drop Cables, and
Neutral Supported Secondary Distribution Cables.

The use of these service drop and secondary distribution cables is limited to circuits not exceeding 600 volts phase-to-phase and to a normal service conductor temperature rating of 75° C or 90° C .

When reference is made in this publication to an industry standard, that reference is to the standard with the title and date of issue listed in Appendix A. Where a conflict exists between the requirements of this standard and those of a referenced standard, the requirements of this standard shall apply.

In this standard, units are most often expressed in the English System. To convert from an English unit to the appropriate metric unit, multiply the value of the English unit by the appropriate number from Appendix B.

The recommended bending radii for phase conductors and cable assemblies is given in Appendix C.

1.2 ASSEMBLIES

Multiplexed cable assemblies are composed of one or more phase conductors assembled with a neutral conductor. The neutral conductor may be bare or covered with an extruded weather-resistant low/linear low, medium, or high-density thermoplastic polyethylene compound, or with a crosslinked polyethylene compound.

1.3 DESIGN OPTIONS

The user of this standard should recognize that it covers many options of two or more conductor aerial assemblies. The user should select the necessary options required for a complete description of the desired cable. See Table 1-1 for design options.

The Aluminum Association booklet "Code Words for Overhead Aluminum Electrical Conductors", lists the code words that have been registered for aluminum phase conductor duplex, triplex, and quadruplex assemblies.

1.4 OPERATING CONDITIONS

The design and construction of the cable shall be such that the cable will operate satisfactorily under the normal conditions of overhead line (aerial) service maximum conductor temperatures as follows:

**Conductor Temperature, °C
Operation**

Insulation Type	Normal Service	Emergency Overload	Short Circuit
Thermoplastic Polyethylene	75	95	150
Crosslinked Polyethylene	90	130	250

Exception: When adequate knowledge of the thermal characteristics of a cable environment is lacking, the permissible conductor temperature should be reduced by 10° C or in accordance with available data.

1.4.1 The 75° C or 90° C "Normal Service Operation" temperature is the highest allowable temperature attained by the hottest portion of a cable line during daily operating load cycles. It shall be used in ampacity calculations where adequate information is known about the overall thermal characteristics of the cable environment to assure that the normal service temperature will not be exceeded.

1.4.2 The 95° C or 130° C "Emergency Overload Operation" temperature is the highest allowable temperature attained by the hottest portion of a cable line during an emergency. Operation at that overload temperature shall not exceed 100 hours in any twelve consecutive months or 500 hours during the lifetime of the cable.

1.4.3 The 150° C or 250° C "Short Circuit Operation" temperature is the highest allowable temperature attained by a phase conductor along any part of the cable line during a short circuit of a specified magnitude and number of cycles. See the latest edition of ICEA Publication P-32-382.

1.4.4 The "Rated Voltage" for the purpose of this standard is 600 volts phase-to-phase.

1.5 TESTING AND TEST FREQUENCY

All cables shall comply with the requirements given in Sections 2, 3, 4, 5 and 7. Each manufacturing or finished length shall be determined to be in compliance with the requirements of Sections 2.5, 3.5, and 5.3, by the methods specified in those sections. There is no frequency for sampling (for test) of cable products or components in this standard. One program of sampling frequencies is given in ICEA T-26-465/NEMA WC 54.

1.6 TEST METHODS

Except where test and measurement methods are specifically detailed or modified by this standard, the methods and procedures used to determine compliance are those applicable in ICEA T-27-581/NEMA WC 53 or other industry standards referenced in this standard.

Table 1-1

**DESIGN OPTIONS FOR NEUTRAL SUPPORTED SERVICE DROP
AND SECONDARY DISTRIBUTION CABLES**

Conductor - Phase

Metal - Aluminum 1350; or annealed copper, coated or uncoated. (See 2.1)

Sizes - Aluminum conductors: 6 AWG to 477 kcmil inclusive; copper conductors:
8 AWG to 2/0 AWG inclusive.

Stranding - (See 2.2)

Conductor - Neutral, See 2.3

- With Aluminum Phase
Conductors

With Copper Phase
Conductors

Aluminum 1350

Hard-drawn copper

Aluminum conductor,
coated steel reinforced

Copper and copper-clad
steel composite

Aluminum conductor,
aluminum-clad steel reinforced

Aluminum Alloy 6201-T81
Hard-drawn copper

Copper and copper-clad steel composite.

Covering - The neutral shall be bare, or covered as per 3.2

Sizes - For the neutral conductor sizes recognized for use with aluminum phase
conductors see Table 2-1, and for those for use with copper phase
conductors, see Table 2-2.

Insulation - 75° C see 3.1, Weather-resistant low, medium, or high-density
polyethylene

90° C see 3.1, Weather-resistant cross-linked polyethylene

Assemblies - See 4.1, Twisted, one or more phase conductors twisted around a
neutral

Parallel, one or more phase conductors laid parallel to and
bound to a neutral

S-Z Assemblies, one or more phase conductors twisted in
alternating direction and bound to a neutral