



ANSI/ICEA S-76-474-2020
Standard for Neutral Supported Power
Cable Assemblies with Weather
Resistant Extruded Insulation Rated

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***Standard for Neutral Supported Power
Cable Assemblies with Weather Resistant
Extruded Insulation Rated 600 Volts***

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Foreword

This standard publication, *Standard for Neutral Supported Power Cable Assemblies with Weather Resistant Extruded Insulation Rated 600 Volts*, was developed by the Insulated Cable Engineers Association, Inc. (ICEA)

ICEA standards and guides are adopted in the public interest and are designed to eliminate misunderstanding between the manufacturer and the user and to assist the user in selecting and obtaining the proper product for his particular need. Existence of an ICEA standard or guide does not in any respect preclude the manufacture or use of products not conforming to the standard or guide. The user of this standard is cautioned to observe any health or safety regulations and rules relative to the manufacture and use of the cable made in conformity with this standard.

Request for interpretation of this standard must be submitted in writing to:

Insulated Cable Engineers Association, Inc.
www.icea.net

An official written interpretation will be provided. Suggestions for improvements gained in the use of this standard will be welcomed by the Association.

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Section 1 GENERAL

1.1 SCOPE

This standard applies to the materials, constructions, and testing of assemblies or single conductors intended for field lashing, 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, or 480 volts phase-to-ground, and to a normal service conductor temperature rating of 75 °C or 90 °C.

1.2 CONSTRUCTIONS

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 thermoplastic or thermoset 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 or a single conductor intended for field assembly. The user should select the necessary options required for a complete description of the desired cable.

1.3.1 Conductors

See Section 2.

Metal – aluminum 1350, or annealed copper, coated or uncoated.

Size – aluminum 6 AWG to 477 kcmil; copper 8 AWG to 4/0 AWG

1.3.2 Insulation

See Section 3.

75 °C Rated – weather resistant low, linear low, medium, or high density polyethylene.

90 °C Rated – weather resistant low, linear low, medium, or high density crosslinked polyethylene.

1.3.3 Neutral

See Section 2.

With aluminum phase conductor(s):

Metal – aluminum 1350, aluminum conductor coated steel reinforced, aluminum conductor aluminum-clad steel reinforced, aluminum alloy 6201-T81, hard-drawn copper, or copper copper-clad steel composite

With copper phase conductor(s):

Metal – hard-drawn copper, or copper copper-clad steel composite

See Section 3 for optional covering.

Size – See Table 2-6 and Table 2-7.

1.3.4 Assembly

See Section 4.

Twisted – One or more insulated phase conductors twisted around a bare or covered neutral without an overall covering.

Parallel – One or more insulated phase conductors laid parallel to and bound to a bare or covered neutral.

S-Z (Reverse Twisted) – One or more insulated conductors twisted in an alternating direction and bound to a bare or covered neutral.

Single – Intended for field lashing applications.

1.4 OPERATING CONDITIONS

The design and construction of the cable shall be such that the cable will operate satisfactorily under maximum conductor temperatures as shown in Table 1-1.

**Table 1-1
CONDUCTOR MAXIMUM RATED TEMPERATURE**

Insulation Temperature Rating, °C	Normal Operation	Emergency Overload	Short Circuit
75	75 °C	95 °C	150 °C
90	90 °C	130 °C	250 °C

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 Normal Operation Temperature

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

1.4.2 Emergency Overload Temperature

The 95 °C or 130 °C "Emergency Overload" temperature is the highest allowable temperature that may be 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 Short Circuit Temperature

The 150 °C or 250 °C "Short Circuit" temperature is the highest allowable temperature that may be attained by an insulated conductor along any part of a cable line during a short circuit of a specified magnitude and number of cycles. (See ICEA Publication P-32-382)

1.4.4 Rated Voltage

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

1.5 QUALIFICATION

Each manufacturer shall qualify their cable. The Qualification Tests in Section 6 are intended to demonstrate the capability of the manufacturer to furnish cables with the desired performance characteristics. Qualification tests shall be made initially on cable specimens and whenever an insulating material is changed. All data shall be recorded and retained. If requested, a manufacturer shall furnish copies of qualification tests on cable specimens with the type of insulation being supplied.

1.6 TESTING

All cables shall comply with the requirements given in Sections 2, 3, 4, and those of Section 6 for Qualification Testing. This standard does not require any specific frequencies for sampling (for test) of cable products or components. One program of suggested sampling frequencies is given in ANSI/NEMA WC-54/ICEA T-26-465.

1.7 TEST METHODS

When cables are tested for the requirements in Sections 2, 3, 4, or 6, the test method shall be in accordance with Section 5 and ANSI/NEMA WC-53/ICEA T-27-581 except where modified in this document.

1.8 STANDARDS AND SPECIFICATIONS

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 A.

U.S. customary units, except for temperature, are specified throughout this standard. Approximate International System of Units (SI) equivalents are included for information only.

The recommended bending radii for insulated conductors and cable assemblies are in Appendix B. Minimum drum diameters of reels for singles and assemblies are in Appendix C. A list of standards and specifications referenced in this document are in Appendix D.