

§ 1755.703 Nonmetallic reinforced (NMR) aerial service wire.

(a) *Conductors.* (1) Each conductor shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraphs 2.2 and 2.2.1. The ANSI/ICEA S-89-648-1993 Standard For Telecommunications Aerial Service Wire, Technical Requirements (approved by ANSI July 11, 1994) is incorporated by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of ANSI/ICEA S-89-648-1993 are available for inspection during normal business hours at RUS, room 2845, U.S. Department of Agriculture, Washington, DC 20250-1500, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html. Copies are available from ICEA, P. O. Box 440, South Yarmouth, MA 02664, telephone number (508) 394-4424.

(2) Factory joints made in the conductors during the manufacturing process shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 2.2.2.

(b) *Conductor insulation.* (1) The raw materials used for the conductor insulation shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraphs 3.2 through 3.2.2.

(2) The finished conductor insulation shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraph 3.2.3.

(3) The dimensions of the insulated conductors shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraph 3.2.3.1.

(4) The colors of the insulation shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraph 3.2.3.2.

(5) A permissible overall performance level of faults in conductor insulation shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 3.2.4.6. The length count and number of faults shall be recorded. The information shall be retained for a period of 6 months and be available for review by RUS when requested.

(6) Repairs to the conductor insulation during manufacture are permissible. The method of repair shall be accepted by RUS prior to its use. The repaired insulation shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 3.2.3.3.

(7) All repaired sections of insulation shall be retested in the same manner as originally tested for compliance with paragraph (b)(5) of this section.

(8) The colored insulating material removed from or tested on the conductor, from a finished wire shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraphs 3.2.4 through 3.2.4.5.

(c) *Identification of pairs and layup of pairs.* (1) The insulation shall be colored coded to identify:

(i) The tip and ring conductor of each pair; and

(ii) Each pair in the completed wire.

(2) The colors to be used in the pairs together with the pair numbers shall be in accordance with the table specified in ANSI/ICEA S-89-648-1993, paragraph 4.1.1.

(3) The insulated conductors shall be either layed parallel (two conductor design only) or twisted into pairs.

(4) When using parallel conductors for the two conductor design, the parallel conductors shall be designed to enable the wire to meet the electrical requirements specified in paragraph (g) of this section.

(5) When twisted pairs are used, the following requirements shall be met:

(i) The pair twists shall be designed to enable the wire to meet the electrical requirements specified in paragraph (g) of this section; and

(ii) The average length of pair twists in any pair in the finished wire, when measured on any 3 meter (10 foot) length, shall not exceed the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 4.1.

(6) An alternative method of forming the two-pair wire is the use of a star-quad configuration.

(i) The assembly of the star-quad shall be such as to enable the wire to meet the electrical requirements specified in paragraph (g) of this section.

(ii) The star-quad configuration shall be assembled in accordance with ANSI/ICEA S-89-648-1993, paragraph 4.1.2.

(iii) The average length of twist for the star-quad in the finished wire, when measured on any 3 meter (10 foot) length, shall not exceed the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 4.1.

(iv) The color scheme used to provide identification of the tip and ring conductors of each pair in the star-quad shall comply with the table specified in ANSI/ICEA S-89-648-1993, paragraph 4.1.2.

(d) *Strength members.* The strength members shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraphs 6.1 and 6.1.1.

(e) *Wire jacket.* (1) The jacket shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraphs 5.1 and 5.1.1.

(2) The jacket raw materials shall be accepted by RUS prior to their use.

(f) *Wire assembly.* The finished wire assembly shall be in accordance with ANSI/ICEA S-89-648-1993, paragraph 5.1.3 and Figure 5-1.

(g) *Electrical requirements—(1) Conductor resistance.* The dc resistance of each conductor in a completed NMR aerial service wire shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.2.

(2) *Resistance unbalance.* (i) The dc resistance unbalance between the two conductors of any pair in a completed NMR aerial service wire and the average resistance unbalance of all pairs in a Quality Control Lot shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.3.

(ii) The resistance unbalance between tip and ring conductors shall be random with respect to the direction of unbalance. That is, the resistance of the tip conductors shall not be consistently higher with respect to the ring conductors and vice versa.

(3) *Dry mutual capacitance.* The dry mutual capacitance of the completed NMR aerial service wire shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.4, Type 1.

(4) *Pair-to-pair capacitance unbalance.* The pair-to-pair capacitance unbalance as measured on the completed NMR aerial service wire shall comply with

the requirements specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.5.

(5) *Attenuation.* (i) The dry attenuation of the completed NMR aerial service wire shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.7.

(ii) The wet attenuation of the completed NMR aerial service wire shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.8.

(6) *Insulation resistance.* (i) The dry insulation resistance of the completed NMR aerial service wire shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.9.

(ii) The wet insulation resistance of the completed NMR aerial service wire shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.10.

(7) *Wet dielectric strength.* The wet dielectric strength between conductors and between each conductor of the completed NMR aerial service wire and the surrounding water shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.11.

(8) *Fusing coordination.* The completed NMR aerial service wire shall comply with the fusing coordination requirement specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.13.

(9) *Crosstalk loss.* (i) The output-to-output far-end crosstalk loss (FEXT) for any pair of completed NMR aerial service wire shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.14.

(ii) The input-to-input near-end crosstalk loss (NEXT) for any pair of completed NMR aerial service wire shall comply with the requirement specified in ANSI/ICEA S-89-648-1993, paragraph 7.2.14.

(h) *Mechanical requirements—(1) Impact test.* (i) All NMR aerial service wires manufactured in accordance with this section shall comply with the unaged impact test specified in §1755.702(f)(1)(i).

(ii) All NMR aerial service wires manufactured in accordance with this section shall comply with the aged impact test specified in §1755.702(f)(1)(ii).

(2) *Abrasion resistance test.* All NMR aerial service wires manufactured in accordance with this section shall comply with the abrasion resistance test specified in §1755.702(f)(2).

(3) *Static load test.* All NMR aerial service wires manufactured in accordance with this section shall comply with the static load test specified in §1755.702(f)(3).

(4) *Elongation test.* All NMR aerial service wires manufactured in accordance with this section shall comply with the elongation test specified in ANSI/ICEA S-89-648-1993, paragraph 8.1.7.

(5) *Plasticizer compatibility test.* All NMR aerial service wires manufactured in accordance with this section shall comply with the plasticizer compatibility test specified in §1755.702(f)(4).

(i) *Environmental requirements—(1) Cold temperature handling test.* (i) All NMR aerial service wires manufactured in accordance with this section shall comply with the unaged cold temperature handling test specified in §1755.702(g)(1)(i).

(ii) All NMR aerial service wires manufactured in accordance with this section shall comply with the aged cold temperature handling test specified in §1755.702(g)(1)(ii).

(2) *Light absorption test.* All NMR aerial service wires manufactured in accordance with this section shall comply with the light absorption test specified in §1755.702(g)(2).

(3) *Flammability test.* All NMR aerial service wires manufactured in accordance with this section shall comply with the flammability test specified in §1755.702(g)(4).

(4) *Wire listing.* All NMR aerial service wires manufactured in accordance with this section shall comply with the listing requirements specified in §1755.702(g)(5).

(j) *Ripcord (optional).* (1) A ripcord may be used in the NMR aerial service wire structure at the option of the manufacturer unless specified by the end user.

(2) When a ripcord is used it shall comply with the requirements specified in ANSI/ICEA S-89-648-1993, paragraphs 4.2 through 4.2.3.

(k) *Identification marker.* Each length of NMR aerial service wire shall be

identified in accordance with ANSI/ICEA S-89-648-1993, paragraphs 9.1 through 9.1.4. When surface marking is employed, the color of the initial marking shall be either white or silver.

(1) *Length marking (optional).* (1) Sequentially numbered length marking of the completed NMR aerial service wire may be used at the option of the manufacturer unless specified by the end user.

(2) When sequentially numbered length markings are used, the length markings shall be in accordance with in accordance with §1755.702(i)(2).

(m) *Durability of marking.* The durability of the marking of the NMR aerial service wire shall comply with the requirements specified in §1755.702(j).

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§ 1755.704 Requirements applicable to both CCSR and NMR aerial service wires.

(a) *Acceptance testing.* (1) The tests described in §§1755.700 through 1755.704 are intended for acceptance of wire designs and major modifications of accepted designs. What constitutes a major modification is at the discretion of RUS. These tests are intended to show the inherent capability of the manufacturer to produce wire products having long life and stability.

(2) For initial acceptance, the manufacturer shall:

(i) Certify that the product fully complies with each paragraph in §§1755.700 through 1755.704;

(ii) Agree to periodic plant inspections by RUS;

(iii) Certify whether the product complies with the domestic origin manufacturing provisions of the “Buy American” requirements of the Rural Electrification Act of 1938 (7 U.S.C. 903 note), as amended (the “REA Buy-American provision”);

(iv) Submit at least three written user testimonials concerning field performance of the product; and

(v) Provide any other nonproprietary data deemed necessary by the Chief, Outside Plant Branch (Telecommunications).

(3) In order for RUS to consider a manufacturer’s request that a product be requalified, the manufacturer shall