

1. Scope

This specification covers the technical requirements for all -dielectric self-supporting aerial optical fiber cables.

2. Material ID Numbers

This specification applies to the following District Material ID numbers: 176009 & 1002216

3. Reference Standards

Unless otherwise stated in this specification, the conductors shall comply with the latest revisions of the following standards:

IEEE 1222 IEEE Standard for All-Dielectric Self-Supporting Fiber Optic Cable
ANSI/TIA/EIA-598-B-2001 Optical Fiber Cable Color Coding

4. Construction

Cables shall be composed of a central dielectric support member surrounded by loose buffer tubes or filler tubes, covered with inner and outer medium density polyethylene (MDPE) jackets separated by a woven aramid yarn sheath for strength and protection. The loose buffer tube design shall isolate the optical fibers from cable tension.

4.1 Material ID No. 1002216

Material ID No. 1002216 shall contain 6 buffer tubes with 12 fibers each for a total of 72 fibers.

4.2 Material ID No. 176009

Material ID No. 176009 shall contain 6 buffer tubes with 6 fibers each for a total of 36 fibers.

5. Dielectric Support Member

The dielectric support member shall be manufactured from a glass/epoxy composite. A MDPE overcoat may be applied to the support member to adjust its outer diameter in order to provide the proper spacing between buffer tubes. The dielectric support member shall not utilize adhesives or any other compounds that must be removed during splicing.

6. Buffer tubes

6.1 Buffer Tube Color Coding

Each buffer tube shall be identified by a color code as follows:

Tube No.	Color
1	Blue
2	Orange
3	Green
4	Brown
5	Slate
6	White

6.2 Filling Compound

Buffer tubes shall be filled with a compound to prevent water intrusion and migration. This compound shall be chemically compatible with all cable components, nonhygroscopic, nontoxic, dermatologically safe and electrically nonconductive.

7. Filler rods

Filler rods shall be made of an unpigmented solid high density polyethylene (HDPE) rod with the same outer diameter as the buffer tubes.

8. Optical Fibers

8.1 Fiber Type

Fiber type shall be dispersion-unshifted single-mode low-water peak optical fiber, EIA Class IVa.

8.2 Fiber Color Coding

Each optical fiber shall be identified by a color coding ink as follows:

Fiber No.	Color
1	Blue
2	Orange
3	Green
4	Brown
5	Slate
6	White

The coloring ink shall be heat stable and chemically compatible with the fiber coating and buffer tube filling compound. It shall not affect the transmission characteristics of the optical fibers.

8.3 Fiber Coating

Each optical fiber shall have an acrylate coating to preserve the fiber's tensile strength. The overall diameter of the optical fiber and uncolored coating shall be $252 \mu\text{m} \pm 7.5 \mu\text{m}$.

8.4 Proof Test

The entire fiber length shall be subjected to a minimum tensile proof test of 0.70 GN/m² (100 kpsi) for a 1.0 second interval.

8.5 Splices

The optical fiber shall contain no factory splices.

8.6 Optical Fiber Manufacturer

Optical fibers from different manufacturers shall not be placed in the same cable or mixed in any cable order without prior District approval.

9. Water Blocking Mechanism

All voids within the cable core shall be filled with a dry block compound to prevent water ingress and migration. This compound shall be chemically compatible with all cable components, nonhygroscopic, nontoxic, dermatologically safe and electrically nonconductive. A material data safety sheet (MSDS) shall be supplied for all blocking compounds.

10. Ripcords

To facilitate cable stripping, a ripcord shall be placed under the inner cable jacket and a second ripcord shall be placed under the outer cable jacket.

11. Cable Marking

11.1 Cable Marking Characteristics

Outer cable jackets shall be indent printed with white characters. Characters shall be approximately 2.5 mm tall.

11.2 Identification Information

The following information will be printed every two feet for the entire cable length:

- “Optical Cable”
- “SNOPUD NO. 1”
- Manufacturer's Name
- Serial Number
- Month and Year of Manufacture
- Number of Fibers (72F, 36F or 12F)
- Sequential Length Marking (in feet)
- Outer Diameter (in inches)

Special cable length numbering, if required, will be indicated on the Special Provisions Sheet.

12. Transmission Performance

12.1 Maximum Attenuation

0.35 db/km maximum attenuation @ 1310 nm.

0.25 db/km maximum attenuation @ 1550 nm.

12.2 Attenuation Uniformity

No attenuation point discontinuity > 0.1 db @ 1310 nm and 1550 nm shall be allowed.

12.3 Chromatic Dispersion

Maximum chromatic dispersion shall be £ 3.2 ps/nm·km @ 1285-1330 nm and £ 18 ps/nm·km @ 1550 nm.

12.4 Cable Cutoff Wavelength

Optical fiber cutoff wavelength shall be £ 1260 nm.

13. Mechanical data

Mechanical data will be considered nominal. Mechanical data based on actual cable design must be submitted for District review and approval prior to bid award.

13.1 Overall Cable Diameter

Overall diameters of the 72 fiber, 36 fiber and 12 fiber cables shall be a 15.1 mm (0.59 in).

13.2 Cable Weight

Cable Weight — 163 kg/km (109 lb/kft)

13.3 Tensile Strength @ 1% Installation Sag

Maximum Allowable Long Term Load (Maximum Sagging Tension) — 5,774 N (1,298 lb)
Maximum Allowable Short Term Load (Maximum Loaded Cable Tension) — 9,732 N (2,188 lb)

13.4 Cable Modulus

Cable Modulus — 562.4 kg/mm² (800 kpsi)

13.5 Linear Expansion Coefficient

Linear Expansion Coefficient — 8.75 x 10⁻⁶ 1/C° (4.86 x 10⁻⁶ 1/F°)

13.6 Minimum Bending Radius

Short Term (loaded) — 330 mm (13 in)
Long Term (unloaded) — 127 mm (6 in)

13.7 Sag & Tension Information

ADSS cable shall have the following nominal sag and tension characteristics based on 1% initial sag and NESC medium loading. Minor variations in sag and tension may be acceptable with prior District approval:

Span (ft)	Initial Tension (lb)	Final Tension (lb)	% Final Sag
100	137	411	1.6
150	205	554	1.7
200	273	682	1.9
250	342	803	2.0
300	410	917	2.1
350	478	1,028	2.2
400	546	1,135	2.3
450	615	1,239	2.3
500	683	1,341	2.4
550	751	1,441	2.5
600	820	1,539	2.5
650	888	1,636	2.6
700	956	1,730	2.6
750	1,025	1,824	2.6
800	1,093	1,917	2.7
850	1,161	2,008	2.7
900	1,229	2,098	2.8
950	1,298	2,188	2.8

14. Environmental Performance

Temperature Ranges

Operation -40°C to +70°C

Installation -30°C to +70°C

Storage/Shipping -50°C to +70°C

15. Packaging requirements

10,000 feet on non-returnable reels, unless otherwise specified on the Special Provisions Sheet. Cable reels shall be shipped upright on flanges.