

CORNING OPTICAL COMMUNICATIONS GENERIC SPECIFICATION FOR ALL DIELECTRIC ARMORED RISER AND PLENUM FIBER OPTIC CABLES

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PGS091

Revision: 3

Corning Optical Communications reserves the right to update this specification without prior notification.

Master Format 27 13 23 Communications Optical Fiber Backbone Cabling
or 27 15 23 Communications Optical Fiber Horizontal Cabling

1.0 General Considerations

The cable must meet the requirements of the National Electrical Code® (NEC)® Section 770.

- 1.1 Plenum Applications - Applicable Flame Test: NFPA 262. Cables shall be listed OFNP (OFCP).
- 1.2 Finished cables shall conform to the applicable performance of the Insulated Cable Engineers Association, Inc. (ICEA) *Standard for Fiber Optic Premises Distribution Cable* (ICEA S-83-596).

2.0 Fiber Specifications

- 2.1 Detailed information on the cabled performance of the fiber types available for this cable design can be found in the following documents:

Dispersion Un-shifted Single-mode Fiber: Generic Specification F3,
“Generic Specification for Single-mode Optical Fiber in Tight Buffer
Cables.”

50/125 µm and 62.5/125 µm Multimode Fiber: Generic Specification F4,
“Generic Specification for Multimode Optical Fiber in Tight Buffer
Cables.”

3.0 Cable Construction

- 3.1 Outer Cable Jacket and Dielectric Armor:
 - 3.1.1 The dielectric armor will serve as both the protective armor and outer jacket in one and will be smooth in appearance.

3.1.1.1 The armor material shall be dielectric (no metal/non-conductive). The cable shall not require bonding or grounding during installation or splicing. The armored cable shall be all-dielectric.

3.1.1.2 The dielectric armor shall be made of polyvinyl chloride (PVC)

3.1.2 The cable outer jacket shall be continuous, free from pinholes, splits, blisters, or other imperfections. The jacket shall have a consistent, uniform thickness; jackets extruded under high pressure are not acceptable. The jacket shall be smooth, as is consistent with the best commercial practice. The jacket shall provide the cable with a tough, flexible, protective coating, able to withstand the stresses expected in normal installation and service.

3.1.3 The nominal thickness of the cable outer jacket shall be sufficient to provide adequate cable protection while meeting the mechanical, flammability, and environmental test requirements of this document over the life of the cable.

3.1.4 The cable jacket color shall be orange for cables containing multimode fiber except for cables containing 50/125 μm Laser Optimized Fiber, which shall have an aqua colored jacket. The cable jacket color shall be yellow for cables containing single-mode fiber.

3.1.5 Cables with dielectric armor shall be available in fiber counts up to 24 fibers.

3.1.6 The dielectric armored cable shall have a crush rating 4X greater than non-armored cable.

3.1.7 The dielectric armored cable shall rebound after a "crush" event.

3.2 Optical Fibers and Inner Cable

3.2.1 The optical fibers shall be coated with a low friction slip layer placed between the acrylate coating of the optical fiber and a thermoplastic buffer coating. The diameter of the thermoplastic buffer coating shall be $900 \pm 50 \mu\text{m}$.

3.2.2 The fiber coating and buffer coating shall be removable with commercially available stripping tools in a single pass for connectorization or splicing.

3.2.3 The individual fibers shall be color coded for identification. The optical fiber color coding shall be in accordance with EIA/TIA-598, "Optical Fiber Cable Color Coding." The coloring material shall be stable over the temperature range of the cable, shall not be susceptible to migration, and shall not affect the transmission characteristics of the

optical fibers. Color-coded buffered fibers shall not adhere to one another.

3.3 Strength Elements

3.3.1 Layered strength yarns shall serve as the tensile strength member of the inner cable.

3.3.2 The yarns shall be spaced evenly around the optical fibers and placed between the optical fibers and an inner cable jacket.

3.4 Inner Cable Jacket

3.4.1 A jacket shall be extruded over the strength yarns for physical and environmental protection. The jacket shall be continuous, free from pinholes, splits, blisters, or other imperfections. The jacket shall have a consistent, uniform thickness. The jacket shall be smooth, as is consistent with the best commercial practice.

3.4.2 The inner jacket shall be marked with the manufacturer's name or ETL file number, date of manufacture, shop order number, optional SOC code (SR#####), fiber count, fiber type, flame rating, listing symbol, and sequential length markings every two feet (e.g., "CORNING OPTICAL CABLE - MM/YY - SO### - SR##### - 12 SME – TB2 - OFNP FT6 c(ETL)us XXXXX FEET"). The marking shall be in contrasting color to the cable jacket.

3.5 Dimensions

3.5.1 The cable outer diameter shall be 8.4mm (.33in) for cables with 6 fibers, 9.2mm (.36in) for cables with 12 fibers and 11.3mm (.44in) for cables with 24 fibers

4.0 Cable Identification

4.1 The outer jacket for all dielectric cable shall be marked with the manufacturer's name or ETL file number, date of manufacture, fiber count, fiber type, flame rating, listing symbol, and sequential length markings every two feet (e.g., "CORNING OPTICAL CABLE - MM/YY - 12 SME – TB2 - OFNP FT6 c(ETL)us XXXXX FEET"). The marking shall be in contrasting color to the cable jacket.

5.0 Cable Performance Specifications

5.1 Temperature Range

5.1.1 Plenum Applications. The storage temperature range for the cable on the original shipping reel shall be -40 °C to +70 °C. The installation temperature range for plenum cables shall be 0 °C to +60 °C. The

operation temperature range shall be 0 °C to +70 °C. Testing shall be in accordance with FOTP-3.

5.2 Crush Resistance

5.2.1 When tested in accordance with FOTP-41, "Compressive Loading Resistance of Fiber Optic Cables," the cable shall withstand a minimum compressive load of 100 N/cm (57 lbf/in) applied uniformly over the length of the compression plate. The load shall be maintained for 10 minutes. While under compressive load, the fiber shall not experience an attenuation change greater than 0.40 dB at 1550 nm (single-mode) or greater than 0.60 dB at 1300 nm (multimode).

5.3 Cyclic Flexing

5.3.1 When tested in accordance with FOTP-104, "Fiber Optic Cable Cyclic Flexing Test," the cable shall withstand 25 mechanical flexing cycles at a rate of 30 ± 1 cycles per minute. The fiber shall not experience an attenuation change greater than 0.40 dB at 1550 nm (single-mode) or greater than 0.60 dB at 1300 nm (multimode). The jacket shall not crack, split, or tear.

5.4 High and Low Temperature Bend

5.4.1 When tested in accordance with FOTP-37, "Fiber Optic Cable Bend Test, Low and High Temperature," the cable shall withstand four full turns around a mandrel at low temperatures of -10 °C for riser cables. The cable shall also withstand four full turns at a high temperature of +60 °C for riser cables. The mandrel diameter shall be the greater of 20 times the cable OD or 150 mm. The fibers shall not experience an attenuation change greater than 0.40 dB at 1550 nm (single-mode) or greater than 0.60 dB at 1300 nm (multimode).

5.5 Impact Resistance

5.5.1 When tested in accordance with FOTP-25, "Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies," the cable shall withstand a minimum of 2 impact cycles at 3 locations spaced a minimum distance of 150 mm. The impact energy shall be 2.94 N•m. The fibers shall not experience an attenuation change greater than 0.40 dB at 1550 nm (single-mode) or greater than 0.60 dB at 1300 nm (multimode). The jacket shall not crack, split or tear.

5.6 Temperature Cycling

5.6.1 When tested in accordance with FOTP-3, "Procedure to Measure Temperature Cycling Effects on Optical Fiber, Optical Cable, and Other Passive Fiber Optic Components," the change in attenuation after the second cycle at the extreme operational temperatures shall not exceed

0.40 dB/km at 1550 nm (single-mode) or 0.60 dB/km at 1300 nm (multimode). The change in attenuation is measured with respect to the baseline values measured at room temperature before temperature cycling. The temperature extremes shall be -20 °C and +70 °C for Riser rated cables.

5.7 Twist-Bend

- 5.7.1 When tested in accordance with FOTP-85, "Fiber Optic Cable Twist Test," a length of cable no greater than 2 meters shall withstand 10 cycles of mechanical twisting and bending. The fibers shall not experience an attenuation change greater than 0.40 dB at 1550 nm (single-mode) or 0.60 dB at 1300 nm (multimode).

5.8 Tensile and Fiber Strain

- 5.8.1 When tested in accordance with FOTP-33, "Fiber Optic Cable Tensile Loading and Bending Test," and FOTP-38, "Measurement of Fiber Strain in Cables Under Tensile Load," a length of cable shall be tested to the rated tensile load. For riser rated cables $\leq 12f$ the rated tensile load is 660 N (148 lbf) and for riser cables $> 12f$ the rated tensile load is 1320 N (297 lbf). While under the rated tensile load, the fiber shall not experience a measured fiber strain greater than 60% of the fiber proof test level. After being held at the residual load (30% of the rated tensile load) the fiber shall not experience a measured fiber strain greater than 20% of the fiber proof test level nor an attenuation change greater than 0.40 dB at 1550 nm (single-mode) or greater than 0.60 dB at 1300 nm (multimode). After the tensile load is removed, the fibers shall not experience an attenuation change greater than 0.40 dB at 1550 nm (single-mode) or greater than 0.60 dB at 1300 nm (multimode).

6.0 Packing and Shipping

- 6.1 The cable shall be packaged in cartons and/or wound on spools. Each package shall contain only one continuous length of cable. The packaging shall be constructed so as to prevent damage to the cable during shipping and handling.
- 6.2 When the length of an order requires a wooden reel the cable shall be covered with a three-layer laminated protective material. The outer end of the cable shall be securely fastened to the reel head so as to prevent the cable from becoming loose in transit. The inner end of the cable shall project into a slot in the side of the reel or into a housing on the inner slot of the drum, in such a manner and with sufficient length to make it available for testing.
- 6.3 Test tails shall be at least two meters long. The inner end shall be fastened so as to prevent the cable from becoming loose during shipping and installation.

6.4 Reel Marking and Labeling. Every cable shall come with the following information:

6.4.1 Reel Label:

Part number
Reel number
Length (ft/m)
Marking (ft/m) top and bottom
Date of manufacture
Listing information

6.4.2 Bar Code Label:

Package ID
Reel number
Quantity
Customer ID
Package count
Factory order number
Release part number
Length (ft)
"Ship to:" address
"Attention to:"

6.4.3 Stenciling:

Manufacturer's name and address
Direction of rotation
Reel size
"DO NOT LAY REEL ON SIDE"

7.0 Quality Assurance Provisions

7.1 All optical fibers in cables lengths of 300 m or greater shall be 100 % attenuation tested. The attenuation shall be measured at 850 nm and 1300 nm for multimode fibers. The attenuation shall be measured at 1310 nm and 1550 nm for single-mode fibers. The manufacturer shall store these values for a minimum of 5 years. These values shall be available upon request.

7.2 The cable manufacturer shall be TL 9000 registered.

8.0 Miscellaneous

8.1 At the request of the customer, the cable manufacturer shall provide installation procedures and technical support concerning the items contained in this specification.

Gen Spec PGS091 Revision History

Revision #	Date	Reason for Change
0	3/31/09	First Publication
1	9/27/09	In section 3.5.2, change to new print statement, "CORNING CABLE SYSTEMS OPTICAL CABLE - MM/YY - SO### - SR##### - 2 MM50 PRETIUM 300 ULTRA-BEND 7.5 – TB2 - OFNR FT4 c(ETL)us XXXXX FEET". Also added reference to new shop order number and optional SOC Code
2	9/13/2017	Reformatted and added Master Format number.
3	12/18/25	Changed cable construction of outer jacket/armor. Removed riser ratings, removed ripcords, updated print statement