

**CORNING OPTICAL COMMUNICATIONS GENERIC SPECIFICATION FOR  
RIBBONIZED OPTICAL FIBER CABLES FOR INDOOR INTERCONNECT APPLICATIONS**

**September 2017  
PGS043  
Revision 12**

*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<sup>®</sup> (NEC<sup>®</sup>) Section 770.

- 1.1      Non-Plenum Applications - Applicable Flame Tests: ANSI/UL 1666. Cables shall be listed OFNR.
- 1.2      Plenum Applications - Applicable Flame Test: NFPA 262. Cables shall be listed OFNP.
- 1.3      Finished cables shall conform to the applicable performance requirements 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:
  - 2.1.1      Dispersion Un-shifted Single-mode Fiber: Generic Specification F3, "Generic Specification for Single-mode Optical Fiber in Tight Buffer Cables."
  - 2.1.2      50/125  $\mu\text{m}$  (12-fiber cable only) and 62.5/125  $\mu\text{m}$  Multimode Fiber: Generic Specification F4, "Generic Specification for Multimode Optical Fiber in Tight Buffer Cables," except as noted below:
    - 2.1.2.1      The maximum cabled attenuation of standard 50/125  $\mu\text{m}$  shall be 5.0/4.0 dB/km at 850/1300 nm.
    - 2.1.2.2      The maximum cabled attenuation of all grades of 62.5/125  $\mu\text{m}$  shall be 5.0/3.0 dB/km at 850/1300 nm.

### 3.0 Cable Construction

#### 3.1 Ribbon Characteristics

- 3.1.1 All fibers in the ribbon must be usable and meet required specifications.
- 3.1.2 The fiber ribbon dimensions shall be measured in accordance with FOTP-123, "Measurement of Optical Fiber Ribbon Dimensions."
- 3.1.3 All fibers in the ribbon shall be parallel and not cross over along the entire length of the cable.
- 3.1.4 The individual fibers shall be color coded 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.
- 3.1.5 The ribbon matrix material shall be removable without damage to the fiber coating using industry standard matrix removal methods or commercially available heat strippers.

#### 3.2 Cable Cores

- 3.2.1 Each cable shall consist of a single 4-, 8-, or 12-fiber ribbon surrounded with high modulus aramid yarns serving as the cable strength member. Non-toxic, non-irritant talc shall be applied to the yarn to allow the yarns to be easily separated from the fiber ribbon and cable jacket.

#### 3.3 Cable Jacket

- 3.3.1 The jacket shall be continuous, free from pinholes, splits, blisters, or other imperfections. 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.
- 3.3.2 The standard cable jacket colors shall be orange for cables containing multimode fiber except for cables containing 50/125  $\mu\text{m}$  Laser Optimized Fiber, which shall have an aqua colored jacket. The standard cable jacket color shall be yellow for cables containing single-mode fiber.

3.3.3 Cable jackets shall be capable of being colored any of the 12 colors identified in EIA/TIA-598, "Optical Fiber Cable Color Coding", if requested to enhance cable identification.

3.4 The cable shall be all-dielectric.

#### **4.0 Cable Identification**

4.1 The outer cable 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 COMMUNICATIONS - MM/YY - SO### - SR##### - 2 MM50 PRETIUM 300 ULTRA-BEND 7.5 – TB2 - OFNR FT4 c(ETL)us XXXXX FEET"). The marking shall be in contrasting color to the cable jacket.

#### **5.0 Cable Performance Specifications**

5.1 Temperature Ranges (Plenum/Non-Plenum)

The storage temperature range for the cable on the original shipping reel shall be -40 °C to +70 °C. The installation temperature range shall be 0 °C to +60 °C. The operating temperature range shall be 0 °C to +70 °C. Testing shall be in accordance with FOTP-3.

5.2 Crush Resistance

When tested in accordance with FOTP-41, "Compressive Loading Resistance of Fiber Optic Cables," the cable shall withstand a minimum compressive load of 35 N/cm (20 lbf/in) applied uniformly over the length of the compression plate. 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

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  $30 \pm 1$  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

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 test temperatures of 0 °C and +60 °C. The mandrel diameter shall be the greater of 20 times the cable OD or 50 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

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 0.74 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

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 at extreme operational temperatures (0 °C to +50 °C) shall not exceed 0.4 dB/km at 1550 nm (single-mode) or 0.6 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.

#### 5.7 Twist

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 around a mandrel 20 times the cable outer diameter. 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

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 for a rated tensile load of 220 N (50 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 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.
- 6.3 Reel Marking and Labeling. Every cable shall come with the following information:

### 6.3.1 Reel Label:

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

### 6.3.2 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:"

## **7.0 Quality Assurance Provisions**

- 7.1 All optical fibers in cable 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 PGS043 Revision History**

<b>Revision #</b>	<b>Date</b>	<b>Reason for Change</b>
2	July 00	Title change; Corning name change
3	June 01	Replaced "teflon" with "low friction slip layer"
4	Sep 01	Removed references to "UL" listings and replaced with "ETL". Did not change UL when referring to standard tests, ie., UL1666.
5	April 02	Replaced UL910 with NFPA 262
6	August 02	Added aqua jacket color
7	Nov 02	Editorial Changes, end of year review
8	July 04	Deleted references to 2-fiber RIC per PCN-109. Revised 2.1.2 to indicate that 5.0/4.0 spec is only for standard 50 micron.
9	February 07	Changed 0.3dB/km for 0.4dB/km value on the temperature cycling test. Changed the title Twist- Bend for just Twist
10	Sep 09	In section 4.1, 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
11	April 12	Added information on colored jackets
12	Sept 17	Reformatted, added Master Format number.