

CORNING OPTICAL COMMUNICATIONS GENERIC SPECIFICATION FOR PLUG & PLAY™ HIGH FIBER COUNT TRUNKS

**September 2017
PGS140
Revision 1**

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 assembly shall meet the requirements of the National Electrical Code® (NEC)® Section 770.

- 1.1 Non-Plenum Applications - Applicable Flame Tests: ANSI/UL 1666. Cables shall be listed OFNR.
- 1.2 Finished cables shall be tested 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:

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 Assembly Construction

3.1 Trunk Function and Construction

- 3.1.1 Trunks shall be constructed from a cable type specified in Table 1.
- 3.1.2 Operating temperature range for cable portion of trunks shall be as indicated in Table 1.
- 3.1.3 Operation of termination portion of trunks shall be -10° to 60° C.
- 3.1.4 Trunks made from non-armored cables shall be of an all-dielectric construction.
- 3.1.5 Trunk fiber count shall be specified as 192, 216, 288, 384, 432 and 576.
- 3.1.6 When terminated with MTP connectors, trunks shall be furcated into 12-fiber legs (subunits). Legs are staggered with a standard 33 inch minimum leg length for the first MTP bundle and with increments of 3 inches for the remaining MTP bundles in order to utilize a small form factor pulling grip.
- 3.1.7 When terminated with MTP connectors, trunks shall be furcated into round legs with diameter specified as 2.0 mm.
- 3.1.8 Trunk length shall be specified as the distance between furcation points at each end of the cable and shall not be inclusive of the length of the legs at each end.
- 3.1.9 MTP trunk furcation shall consist of a heat shrink style furcation for all fiber count trunks. Both options will have an integrated strain relief feature to secure the trunk cable into hardware.
- 3.1.10 Trunk furcation shall provide a mounting point for a protective pulling grip and shall be capable of sustaining the rated tensile load of 100 lbf. for all indoor high fiber count trunks.
- 3.1.11 Trunks shall meet the connector performance specifications of TIA/EIA-568-C.3, *Optical Fiber Cabling Components Standard*, (normative) Annex A.

Table 1: Trunks - Available Cables Types

Cable Type/Flame Rating (Fibers)	Design & Test Criterion ⁽³⁾	Special Features
Indoor/Plenum ^(1,2) 192,216,288,384,432 and 576 Fiber Distribution Cable	ICEA S-83-596	-10°/60° C operating range Optimal cable routing

Note (1): Non-armored cables are all-dielectric.

Note (2): Cable Standards published by Insulated Cable Engineers Association (ICEA).

Note (3): Trunks are offered with 2mm round furcation legs providing optimal routing through cable pathways and hardware.

3.2 Trunk Fiber Types, Optical Specifications, and Jacket Color

3.2.1 Available fiber types and their optical performance specifications shall be as indicated in Table 2.

3.2.2 Trunk jacket color shall be as indicated in Table 2.

3.3 Trunk Connectivity

3.3.1 Where modular trunks are specified, connectors shall be MTP connectors having 12 fibers per ferrule.

3.3.2 MTP-terminated primary trunks shall have non-pinned MTP connectors on both ends.

3.3.3 MTP-terminated extender trunks shall have pinned MTP connectors on the end to be interconnected with a primary trunk and non-pinned MTP connectors on the other end.

3.3.4 Trunks shall be offered with Type A, B and C configurations per TIA/EIA-568-C.3

Note: Type A trunks provide 1-to-1 fiber transmission when used with Universal or Classic modules.

Table 2: Trunks - Available Fiber Types, Optical Specifications, Jacket Colors

Property	Multimode		Single-mode
	OM3 50/125 (850/1300nm)	OM4 50/125 (850/1300nm)	OS2 8.3/125 (1310/1550 nm)
Fiber Attenuation, max (dB/km)	3.0/1.0	3.0/1.0	0.4/0.3
LED Bandwidth, min (MHz•km)	1500/500	1500/500	--/--
Effective Modal Bandwidth, min (MHz•km)	2000/-- ⁽¹⁾	4700/-- ⁽¹⁾	--/--
Jacket Color Indoor Cable	Aqua	Aqua	Yellow

Note (1): As predicted by minEMBc, per TIA/EIA 455-220 and IEC 60793-1-49 for *high performance laser-based systems* (up to 10 Gb/s).

3.4 Trunk Protective Pulling Grips and Covers

3.4.1 Trunks shall have a protective packaging over the furcation plug, legs, and connectors on both ends. Customer may specify a protective pulling grip on one end, or neither end. When pigtail trunks are specified, a Kellums grip shall be provided on the non-connectorized cable end.

3.4.2 Pulling grips shall be fastened to the furcation in a manner that isolates the cable assembly components (connectors and legs) from tension, torsion, crush, and bending loads encountered when following recommended installation practices.

3.4.3 Pulling grips shall withstand a maximum pulling force of 100lbf for all indoor high fiber count trunks.

3.4.4 Where specified with MTP connectors on both ends, grip diameter and minimum allowable bend radius shall be as indicated in Table 3.

Table 3: Pulling Grip Specifications – MTP-Terminated Trunks

Cable Type/ Fiber count	Grip Outer Diameter (in)	Recommended Minimum Duct Size/ Minimum bend Radius
Non-Armored 192 to 288 Fibers	1.5"	2.0 in. with 18 in. elbow
Non-Armored 384 to 576Fibers	1.9"	2.5 in. with 18 in. elbow

4.0 Cable Identification

- 4.1 The outer cable jacket shall be marked with the manufacturer's name, date of manufacture, fiber count, fiber type, flame rating, listing symbol, and sequential length markings every two feet (e.g., "CORNING OPTICAL COMMUNICATIONS OPTICAL CABLE - MM/YY. XXXXX (feet or meters). The marking shall be in contrasting color to the cable jacket.

5.0 Cable Assembly Performance Specifications

5.1 Trunk Function and Construction

- 5.1.1 Trunks shall be constructed from a cable type specified in Table 4.
- 5.1.2 Operating temperature range for cable portion of trunks shall be as indicated in Table 4.
- 5.1.3 Operation of termination portion of trunks shall be -10° to 60° C.
- 5.1.4 Trunks made from non-armored cables shall be of an all-dielectric construction.
- 5.1.5 Trunks made from armored cables shall maintain electrical continuity across their entire length and shall have a grounding wire bonded to the armor at both ends. Armoring construction shall be of corrugated steel tape.
- 5.1.6 Trunk fiber count shall be specified from 12 through 864 fibers, armor and non-armor.
- 5.1.7 When terminated with MTP connectors, trunks shall be furcated into 12-fiber legs (subunits). Leg length on 12 through 576 fiber trunks shall be 36"-3/+0. 864 fiber trunk leg length shall be staggered into two MTP bundle groups, 36"-3/+0 and 41"-3/+0.
- 5.1.8 When terminated with MTP connectors, trunks shall be furcated into legs with 2.9 mm round or rectangular legs depending on cable type.
- 5.1.9 Trunk length shall be specified as the distance between furcation points at each end of the cable and shall not be inclusive of the length of the legs at each end.
- 5.1.10 MTP trunk furcation shall consist of an epoxy filled plug that provides a means to strain relief the trunks via heavy duty tie-wraps.
- 5.1.11 Trunk furcation shall provide a mounting point for a protective pulling grip and shall be capable of sustaining the rated tensile load of 300lbf for all indoor-outdoor high fiber count trunks.

5.1.12 Trunks shall be manufactured from cables qualified to the design and test criterion indicated in Table 4.

5.1.13 Trunks shall meet the connector performance specifications of Telcordia GR-1435-CORE, Generic Performance for Multi-fiber Optical Connectors.

Table 4: Trunks - Available Cables Types

Cable Type/Flame Rating (12, 24, 36, 48, 72, 96, 144 Fibers)	Design & Test Criterion ⁽³⁾	Special Features
Indoor-Outdoor/Riser and LSZH Ribbon ^(1,2) offered in dielectric and armor versions with fiber counts of 288, 432, 576 and 864.	ICEA S-104-696	-40°/70° C operating range UV protected, water blocked high fiber density
12 to 288 fiber Indoor-Outdoor versions are available as loose tube ^(1,2) riser and LSZH distribution cables offered in dielectric and armor versions.	ICEA S-104-696	-40°/70° C operating range UV protected, water blocked high fiber density

Note (1): Non-armored cables are all-dielectric.

Note (2): All trunks are available with aluminum interlocking armor for increased mechanical protection.

Note (3): Cable Standards published by Insulated Cable Engineers Association (ICEA).

Note (4): Trunks constructed with Loose tube cable are offered with 2.9 mm round furcation legs providing easy routing through cable pathways and hardware.

5.2 Trunk Fiber Types, Optical Specifications, and Jacket Color

5.2.1 Available fiber types and their optical performance specifications shall be as indicated in Table 5.

5.2.2 Trunk jacket color shall be as indicated in Table 5.

5.3 Trunk Connectivity

5.3.1 Where modular trunks are specified, connectors shall be MTP connectors having 12 fibers per ferrule.

5.3.2 MTP-terminated primary trunks shall have non-pinned MTP connectors on both ends.

5.3.3 MTP-terminated extender trunks shall have pinned MTP connectors on the end to be interconnected with a primary trunk and non-pinned MTP connectors on the other end.

5.3.4 Trunks shall be offered with Type A, B and C configurations per TIA/EIA-568-C.3

Note: Type A trunks provide 1-to-1 fiber transmission when used with Universal or Classic modules.

Table 5: Trunks - Available Fiber Types, Optical Specifications, Jacket Colors

Property	Multimode		Single-mode
	OM3 50/125 (850/1300nm)	OM4 50/125 (850/1300nm)	OS2 8.3/125 (1310/1550 nm)
Fiber Attenuation, max (dB/km)	3.0/1.0	3.0/1.0	0.4/0.3
LED Bandwidth, min (MHz•km)	1500/500	1500/500	--/--
Effective Modal Bandwidth, min (MHz•km)	2000/-- ⁽¹⁾	4700/-- ⁽¹⁾	--/--
Jacket Color			
Indoor Cable			
Indoor-Outdoor Cable	Black	Black	Black

Note (1): As predicted by minEMBc, per TIA/EIA 455-220 and IEC 60793-1-49 for *high performance laser-based systems* (up to 10 Gb/

5.4 Trunk Protective Pulling Grips and Covers

- 5.4.1 Trunks shall have a protective packaging over the furcation plug, legs, and connectors on both ends. Customer may specify a protective pulling grip on one end, or neither end. When pigtail trunks are specified, a Kellums grip shall be provided on the non-connectorized cable end.
- 5.4.2 Pulling grips shall be fastened to the furcation in a manner that isolates the cable assembly components (connectors and legs) from tension, torsion, crush, and bending loads encountered when following recommended installation practices.
- 5.4.3 Pulling grips shall withstand a maximum pulling force of 300lbf for all indoor-outdoor high fiber count trunks.
- 5.4.4 Pulling grips for trunks with fiber counts from 12 to 144 fiber shall be water tight.
- 5.4.5 Where specified with MTP connectors on both ends, grip diameter and minimum allowable bend radius shall be as indicated in Table 6.

Table 6: Pulling Grip Specifications – MTP-Terminated Trunks⁽¹⁾

Cable Type/ Fiber count	Grip Outer Diameter (in)	Recommended Minimum Duct Size/ Minimum bend Radius
-------------------------	--------------------------	--

Non-Armored and armor 12-288 Fibers	2.5"	3.5 in. with 24 in. elbow
Non-Armored and armor 432-864 Fibers	4"	Pigtail assembly recommended for deployment.

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 1310 nm and 1550 nm. 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 PGS140 Revision History

Revision #	Date	Reason for Change
0	12/8/14	Document creation
1	9/15/17	Reformatted, added Master Format number and added sections for Identification, Packing and Shipping, Quality Assurance Provisions and Miscellaneous.