SECTION 27 15 23

COMMUNICATIONS OPTICAL FIBER FOR HORIZONTAL CABLING

[Specifier Notes] – This document uses hidden text to guide the specifier through various options while editing the document. Hidden text may be turned on two ways: with the “Show/Hide” symbol “¶” in the ribbon; or selecting “File” above the ribbon at the top left, then “Options” at the very lower left, then “Display” on the left side of the menu pop-up, and then check the box next to “Hidden Text.”

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1. GENERAL
	1. SECTION INCLUDES
		1. Optical Fiber for Tight Buffered Cables.
		2. Indoor Tight Buffered Optical Fiber Cables.
		3. Indoor Tight Buffered Armored Optical Fiber Cables.
		4. Indoor Tight Buffered Dielectric Armored Optical Fiber Cables.
	2. RELATED SECTIONS

[Specifier Notes]: Remove sections not required under project scope of work.

* + 1. Section 27 11 16 - Communications Cabinets, Racks, Frames and Enclosures.
		2. Section 27 13 23 - Communications Optical Fiber Backbone Cabling.
		3. Section 27 13 23 13 - Communications Optical Fiber Splicing and Terminations.
		4. Section 33 82 23 - Optical Fiber Communications Distribution Cabling.
	1. SUBMITTALS
		1. Submit in accordance with requirements of Section 01 30 00 - Administrative Requirements.
		2. Submittals for Initial Selection:
			1. Product Data: Manufacturer's technical data sheets, specifications, performance data and installation instructions for all products referenced in the scope of work defined in this section.
			2. Shop Drawings: Submit shop drawings required to depict the requirements for fabrication and installation. Include the following drawings as applicable:
				1. Proposed riser and horizontal cabling diagram.
				2. Overlay of system components on floor plans.
			3. Sample Warranty Information:
				1. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.
		3. Closeout submittals
			1. Maintenance Contracts.
			2. Operation and Maintenance Data.
			3. Preventative Maintenance Instructions.
			4. Final Site Survey.
			5. Warranties for all manufactured components specified in this section.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Minimum 25 years in business manufactured at a facility in the United States.
		2. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer of optical fiber.
	3. DELIVERY STORAGE AND HANDLING
		1. Deliver, store and handle materials and products in accordance with the manufacturer's instructions and recommendations and industry standards.
		2. Store all materials in the manufacturer’s original packaging until ready for installation. Protect all products from damage or exposure to adverse environmental conditions, including weather, humidity, and dust.
	4. Project Conditions
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	5. Warranty
		1. Manufacturer’s Warranty: Manufacturer agrees to replace or refund the purchase price of products that fail from defects in material and workmanship within the specified warranty period.
			1. Warranty Period: One (1) year from date of Substantial Completion.
		2. Manufacturer’s Extended Warranty: Manufacturer agrees to replace or refund the purchase price of products that are installed by a manufacturer-certified installer that fail from defects in material and workmanship within the specified warranty period.
			1. Warranty Period: Twenty-five (25) years from date of Substantial Completion.
1. PRODUCTS
	1. MANUFACTURERS

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Corning Optical products listed as the Basis of Design. Delete if not required.

* + 1. Basis of Design Manufacturer: Corning Optical Communications LLC.
			1. Address: 4200 Corning Place; Charlotte, NC 28216.
			2. Toll Free Phone: (800)743-2675.
			3. Phone: (828)901-5000.
			4. Fax: (828)325-5060.
			5. Website: [www.corning.com/opcomm](https://www.corning.com/opcomm)
			6. Email: ccsamericas@corning.com.

[Specifier Notes] – Retain the following Paragraph if this document is written as a PERFORMANCE specification, without listing a manufacturer as a basis of design. Insert manufacturers that sell products comparable to those specified in this section. Delete if not required.

* + 1. Manufacturer List:
			1. Manufacturer:
		2. Substitution Limitations:
			1. Submit substitution requests in accordance with provisions of Section 01 60 00.
			2. Single manufacturer will provide, from a single source, optical fiber and accessories.
	1. PERFORMANCE REQUIREMENTS
		1. Cabling System Requirements:
			1. General Requirements: Provide cabling system able to support interconnections to active telecommunications equipment for voice and data applications in a multi-vendor, multi product environment.
			2. Structured cabling system should adhere to the following:
				1. General: Provide cabling system in compliance with ANSI/TIA-568-D.
				2. Pathways: Provide cabling system for pathways and spaces in compliance with ANSI/TIA-569-C.
				3. Labelling: Provide cabling system labelled in compliance with ANSI/TIA-606-B.
				4. Grounding and Bonding: Provide cabling system grounded and bonded in accordance with ANSI/TIA-607-C.
				5. Color Coding: Provide cabling system color coded in compliance with ANSI/TIA-598-C.
				6. Data Centers: Provide cabling system in compliance with ANSI/TIA-942-B.
	2. Optical Fiber for tight buffered cables
		1. General Requirements: Provide optical fiber consisting of germania-doped silica core surrounded by a concentric glass cladding in accordance with the following requirements and compatible with the cable types specified below.
			1. Surface Imperfections: None.
			2. Protective Coating: Manufacturer’s standard dual layer acrylate in contact with the cladding surface.
			3. Proof Test: Minimum 100 kpsi (0.7 GN/m2).
		2. Single Mode (Dispersion Un-shifted) with Low Water Peak.
			1. Specifications:
				1. TIA/EIA-492CAAB.
				2. ITU G.652 (Categories A, B, C, and D).
			2. Geometry Requirements:
				1. Cladding:

Diameter: Between 125.0±0.7 µm.

Non-Circularity: No more than 0.7 percent.

* + - * 1. Mode Field Diameter:

9.2±0.4 µm at 1310 nm.

10.4±0.5 µm at 1550 nm.

* + - * 1. Core-to-Cladding Concentricity: No more than 0.5 µm.
				2. Coating Diameter: 245±5 µm.
				3. Fiber Curl: Radius of curvature no less than 4.0 m.
			1. Optical Requirements:
				1. Cabled Fiber Attenuation:

No more than 0.65 dB/km at 1310 nm.

No more than 0.65 dB/km at 1383±3 nm.

No more than 0.50 dB/km at 1550 nm.

* + - * 1. Point Discontinuity: No more than 0.05 dB at 1310 nm and 1550 nm.
				2. IEEE 802.3z GbE Distance: Up to 5000 m at 1300 nm.
		1. Single-Mode (Dispersion Un-shifter) Bend Improved Optical Fiber.
			1. Specifications:
				1. TIA/EIA-492CAAB.
				2. ITU-T G.652.D
				3. ITU-T G.657, Table A.
			2. Geometry Requirements:
				1. Cladding:

Diameter: Between 125.0±0.7 µm.

Non-Circularity: No more than 0.7 percent.

* + - * 1. Mode Field Diameter:

8.6±0.4 µm at 1310 nm.

9.8±0.5 µm at 1550 nm.

* + - * 1. Core-to-Cladding Concentricity: No more than 0.5 µm.
				2. Coating Diameter: 245±5 µm.
				3. Fiber Curl: Radius of curvature no less than 4.0 m.
			1. Optical Requirements:
				1. Cabled Fiber Attenuation:

No more than 0.65 dB/km at 1310 nm.

No more than 0.65 dB/km at 1383±3 nm.

No more than 0.50 dB/km at 1550 nm.

* + - * 1. Point Discontinuity: No more than 0.05 dB at 1310 nm and 1550 nm.
				2. IEEE 802.3z GbE Distance: Up to 5000 m at 1300 nm.
		1. Single-Mode (Dispersion Un-shifted) Bend-Tolerant Optical Fiber.
			1. Specifications:
				1. ITU-T G.652, Table D.
				2. ITU-T G.657, Tables A2 and B2.
				3. IEC 60793-2-50, Type B1.3 and B6\_b.
				4. Telecordia GR-20-CORE.
			2. Geometry Requirements:
				1. Cladding:

Diameter: Between 125.0±0.7 µm.

Non-Circularity: No more than 0.7 percent.

* + - * 1. Mode Field Diameter:

8.6±0.4 µm at 1310 nm.

9.65±0.5 µm at 1550 nm.

* + - * 1. Core-to-Cladding Concentricity: No more than 0.5 µm.
				2. Coating Diameter: 245±5 µm.
				3. Fiber Curl: Radius of curvature no less than 4.0 m.
			1. Optical Requirements:
				1. Cabled Fiber Attenuation:

No more than 0.65 dB/km at 1310 nm.

No more than 0.65 dB/km at 1383±3 nm.

No more than 0.50 dB/km at 1550 nm.

* + - * 1. Point Discontinuity: No more than 0.05 dB at 1310 nm and 1550 nm.
				2. IEEE 802.3z GbE Distance: Up to 5000 m at 1300 nm.
		1. Single-Mode (Dispersion Un-shifted) Bend Insensitive Optical Fiber.
			1. Specifications:
				1. ITU-T G.652, Table D.
				2. ITU-T G.657, Table B3.
			2. Geometry Requirements:
				1. Cladding:

Diameter: Between 125.0±0.7 µm.

Non-Circularity: No more than 0.7 percent.

* + - * 1. Mode Field Diameter:

8.6±0.4 µm at 1310 nm.

9.65±0.5 µm at 1550 nm.

* + - * 1. Core-to-Cladding Concentricity: No more than 0.5 µm.
				2. Coating Diameter: 245±5 µm.
				3. Fiber Curl: Radius of curvature no less than 4.0 m.
			1. Optical Requirements:
				1. Cabled Fiber Attenuation:

No more than 0.65 dB/km at 1310 nm.

No more than 0.50 dB/km at 1550 nm.

* + - * 1. Point Discontinuity: No more than 0.05 dB at 1310 nm and 1550 nm.
		1. Multimode Standard 62.5/125 μm Fiber (OM1).
			1. Specifications:
				1. TIA/EIA-492AAAA-A-1997.
				2. IEC 60793-2-10.
			2. Geometry Requirements:
				1. Core:

Diameter: 62.5±2.5 µm.

Non-Circularity: No more than 5 percent.

* + - * 1. Cladding:

Diameter: 125±2 µm.

Non-Circularity: No more than 1 percent.

* + - * 1. Core-to-Cladding Concentricity: No more than 1.5 µm.
				2. Coating Diameter: Primary, Uncolored; 242±5 µm.
				3. Colored Fiber Nominal Diameter: Between 253 and 259 µm.
			1. Optical Requirements:
				1. Cabled Fiber Attenuation:

No more than 2.8 dB/km at 850 nm.

No more than 1.0 dB/km at 1300 nm.

* + - * 1. Point Discontinuity: No more than 0.2 dB at 850 nm and 1300 nm.
				2. Cabled Effective Modal Bandwidth: No less than 220 MHz·km at 850 nm.
				3. IEEE 802.3z GbE Distance:

Up to 300 m at 850 nm.

Up to 550 m at 1300 nm.

* + - * 1. OFL Bandwidth:

No less than 200 MHz·km at 850 nm.

No less than 500 MHz·km at 1300 nm.

* + - * 1. Numerical Aperture: 0.275±0.015.
		1. Multimode Standard 50/125 μm Fiber – 150 (OM2).
			1. Specifications:
				1. TIA/EIA-492AAAB.
				2. IEC 60793-2-10.
			2. Geometry Requirements:
				1. Core:

Diameter: 50.0±2.5 µm.

Non-Circularity: No more than 5 percent.

* + - * 1. Cladding:

Diameter: 125±1 µm.

Non-Circularity: No more than 1 percent.

* + - * 1. Core-to-Cladding Concentricity: No more than 1.5 µm.
				2. Coating Diameter: Primary, Uncolored; 242±5 µm.
				3. Colored Fiber Nominal Diameter: Between 253 and 259 µm.
			1. Optical Requirements:
				1. Cabled Fiber Attenuation:

No more than 3.4 dB/km at 850 nm.

No more than 1.0 dB/km at 1300 nm.

* + - * 1. Point Discontinuity: No more than 0.2 dB at 850 nm and 1300 nm.
				2. Cabled Effective Modal Bandwidth: No less than 950 MHz·km at 850 nm.
				3. IEEE 802.3z GbE Distance:

Up to 750 m at 850 nm.

Up to 600 m at 1300 nm.

* + - * 1. IEEE 802.3ae 10 GbE Distance: Up to 150 m at 850 nm.
				2. OFL Bandwidth:

No less than 700 MHz·km at 850 nm.

No less than 500 MHz·km at 1300 nm.

* + - * 1. Numerical Aperture: 0.200±0.015.
		1. Multimode Laser-optimized 50/125 μm Fiber – 300 (OM3).
			1. Specifications:
				1. TIA/EIA-492AAAC.
				2. IEC 60793-2-10.
			2. Geometry Requirements:
				1. Core:

Diameter: 50.0±2.5 µm.

Non-Circularity: No more than 5 percent.

* + - * 1. Cladding:

Diameter: 125±1 µm.

Non-Circularity: No more than 1 percent.

* + - * 1. Core-to-Cladding Concentricity: No more than 1.5 µm.
				2. Coating Diameter: Primary, Uncolored; 242±5 µm.
				3. Colored Fiber Nominal Diameter: Between 253 and 259 µm.
			1. Optical Requirements:
				1. Cabled Fiber Attenuation:

No more than 2.8 dB/km at 850 nm.

No more than 1.0 dB/km at 1300 nm.

* + - * 1. Point Discontinuity: No more than 0.2 dB at 850 nm and 1300 nm.
				2. Cabled Effective Modal Bandwidth: No less than 2000 MHz·km at 850 nm.
				3. IEEE 802.3z GbE Distance:

Up to 1000 m at 850 nm.

Up to 600 m at 1300 nm.

* + - * 1. IEEE 802.3ae 10 GbE Distance: Up to 300 m at 850 nm.
				2. OFL Bandwidth:

No less than 1500 MHz·km at 850 nm.

No less than 500 MHz·km at 1300 nm.

* + - * 1. Numerical Aperture: 0.200±0.015.
		1. Multimode Laser-optimized 50/125 μm Fiber – 550 (OM4).
			1. Specifications:
				1. TIA/EIA-492AAAD.
			2. Geometry Requirements:
				1. Core:

Diameter: 50.0±2.5 µm.

Non-Circularity: No more than 5 percent.

* + - * 1. Cladding:

Diameter: 125±1 µm.

Non-Circularity: No more than 1 percent.

* + - * 1. Core-to-Cladding Concentricity: No more than 1.5 µm.
				2. Coating Diameter: Primary, Uncolored; 242±5 µm.
				3. Colored Fiber Nominal Diameter: Between 253 and 259 µm.
			1. Optical Requirements:
				1. Cabled Fiber Attenuation:

No more than 2.8 dB/km at 850 nm.

No more than 1.0 dB/km at 1300 nm.

* + - * 1. Point Discontinuity: No more than 0.2 dB at 850 nm and 1300 nm.
				2. Cabled Effective Modal Bandwidth: No less than 4700 MHz·km at 850 nm.
				3. IEEE 802.3z GbE Distance:

Up to 1100 m at 850 nm.

Up to 600 m at 1300 nm.

* + - * 1. IEEE 802.3ae 10 GbE Distance: Up to 550 m at 850 nm.
				2. OFL Bandwidth:

No less than 3500 MHz·km at 850 nm.

No less than 500 MHz·km at 1300 nm.

* + - * 1. Numerical Aperture: 0.200±0.015.
		1. Multimode Laser-optimized 50/125 μm Fiber – 600 (OM4).
			1. Specifications:
				1. TIA/EIA-492AAAD.
			2. Geometry Requirements:
				1. Core:

Diameter: 50.0±2.5 µm.

Non-Circularity: No more than 5 percent.

* + - * 1. Cladding:

Diameter: 125±1 µm.

Non-Circularity: No more than 1 percent.

* + - * 1. Core-to-Cladding Concentricity: No more than 1.5 µm.
				2. Coating Diameter: Primary, Uncolored; 242±5 µm.
				3. Colored Fiber Nominal Diameter: Between 253 and 259 µm.
			1. Optical Requirements:
				1. Cabled Fiber Attenuation:

No more than 2.8 dB/km at 850 nm.

No more than 1.0 dB/km at 1300 nm.

* + - * 1. Point Discontinuity: No more than 0.2 dB at 850 nm and 1300 nm.
				2. Cabled Effective Modal Bandwidth: No less than 5350 MHz·km at 850 nm.
				3. IEEE 802.3z GbE Distance:

Up to 1100 m at 850 nm.

Up to 600 m at 1300 nm.

* + - * 1. IEEE 802.3ae 10 GbE Distance: Up to 600 m at 850 nm.
				2. OFL Bandwidth:

No less than 3500 MHz·km at 850 nm.

No less than 500 MHz·km at 1300 nm.

* + - * 1. Numerical Aperture: 0.200±0.015.
	1. Indoor Tight Buffered Optical Fiber Cables

Specifier Notes – For more information about tight buffer fiber optic cables in this article see: https://www.corning.com/catalog/coc/documents/generic-specifications/PGS049.pdf

* + 1. General Requirements: Provide fiber optic cables that meet the following requirements when tested in accordance with the testing requirements in this section.
			1. Attenuation: Fiber optic cables shall not exceed the following change in attenuation:
				1. Single mode: 0.4 dB at 1550 nm.
				2. Multimode: 0.6 dB at 1300 nm.
			2. Jacket shall not crack, split, or tear.
			3. No mechanical damage to fibers.
		2. Testing Requirements:
			1. Temperature Cycling for Tight Buffered and Hybrid Fiber Optic Cables: FOTP-3.
				1. Storage: -40 °C to 70 °C (-40 °F to 158 °F).
				2. Installation: -10 °C to 60 °C (14 °F to 140 °F).
				3. Operation: -20 °C to 70 °C (-4 °F to 158 °F).
			2. Crush Resistance: FOTP-41.
				1. Force: 100 N/cm (57 lbf/in).
			3. Cyclic Flexing: FOTP-104.
			4. Bending: FOTP-37.
			5. Impact Resistance: FOTP-25.
				1. Impact Energy: 2.94 N⋅m (26.38 in⋅lbf).
			6. Twisting: FOTP-85.
			7. Tensile and Fiber Strain: FOTP-33.
				1. Cables under 12 feet (3.7 m): 660 N (148 lbf).
				2. Cables over 12 feet (3.7 m): 1320 N (297 lbf).
		3. Indoor Tight-Buffered 2- to 24-Fibers Riser Cables.

[Specifier Notes] – Retain the following paragraph if this document is a PROPRIETARY Specification, with Corning Optical products listed as the Basis of Design. Delete if not required.

* + - 1. Basis of Design Product: MIC Tight Buffered, Riser, by Corning Optical.
			2. Riser Flame and Smoke: Provide cable in compliance with UL 1666.
			3. Color: Cable jacket available in up to 12 colors.
			4. Physical Performance: Provide cable with buffered fibers surrounded by dielectric strength elements, with a flame-retardant jacket in compliance with NEC 770.

[Specifier Notes] – Retain one of the following seven paragraphs to meet project requirements.

* + - * 1. Fiber Count: Two (2) single-layer fibers.
				2. Fiber Count: Four (4) single-layer fibers.
				3. Fiber Count: Six (6) single-layer fibers.
				4. Fiber Count: Eight (8) single-layer fibers.
				5. Fiber Count: Twelve (12) dual-layer fibers.
				6. Fiber Count: Sixteen (16) dual-layer fibers.
				7. Fiber Count: Twenty-four (24) dual-layer fibers.
		1. Indoor Armored Tight-Buffered 2- to 24-Fibers Riser Cables.

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* + - 1. Basis of Design Product: MIC Tight Buffered, Interlocking Armored, Riser, by Corning Optical.
			2. Riser Flame and Smoke: Provide cable in compliance with UL 1666.
			3. Core Protection: Flexible, spirally wrapped, aluminum interlocking armor.
			4. Color: Cable jacket available in up to 12 colors.
			5. Physical Performance: Provide cable with buffered fibers around a dielectric central element, with a flame-retardant jacket in compliance with NEC 770.

[Specifier Notes] – Retain one of the following seven paragraphs to meet project requirements.

* + - * 1. Fiber Count: Two (2) single-layer fibers.
				2. Fiber Count: Four (4) single-layer fibers.
				3. Fiber Count: Six (6) single-layer fibers.
				4. Fiber Count: Eight (8) single-layer fibers.
				5. Fiber Count: Twelve (12) dual-layer fibers.
				6. Fiber Count: Sixteen (16) dual-layer fibers.
				7. Fiber Count: Twenty-four (24) dual-layer fibers.
		1. Indoor Tight-Buffered 2- to 24-Fibers Plenum Cables.

[Specifier Notes] – Retain the following paragraph if this document is a PROPRIETARY Specification, with Corning Optical products listed as the Basis of Design. Delete if not required.

* + - 1. Basis of Design Product: MIC Tight Buffered, Plenum, by Corning Optical.
			2. Plenum Flame and Smoke: Provide cable in compliance with NFPA 262.
			3. Color: Cable jacket available in up to 12 colors.
			4. Physical Performance: Provide cable with buffered fibers surrounded by dielectric strength elements, with a flame-retardant jacket in compliance with NEC 770.

[Specifier Notes] – Retain one of the following seven paragraphs to meet project requirements.

* + - * 1. Fiber Count: Two (2) single-layer fibers.
				2. Fiber Count: Four (4) single-layer fibers.
				3. Fiber Count: Six (6) single-layer fibers.
				4. Fiber Count: Eight (8) single-layer fibers.
				5. Fiber Count: Twelve (12) dual-layer fibers.
				6. Fiber Count: Sixteen (16) dual-layer fibers.
				7. Fiber Count: Twenty-four (24) dual-layer fibers.
		1. Indoor Armored Tight-Buffered 2- to 24-Fibers Plenum Cables.

[Specifier Notes] – Retain the following paragraph if this document is a PROPRIETARY Specification, with Corning Optical products listed as the Basis of Design. Delete if not required.

* + - 1. Basis of Design Product: MIC Tight Buffered, Interlocking Armored, Plenum, by Corning Optical.
			2. Plenum Flame and Smoke: Provide cable in compliance with NFPA 262.
			3. Core Protection: Flexible, spirally wrapped, aluminum interlocking armor.
			4. Color: Cable jacket available in up to 12 colors.
			5. Physical Performance: Provide cable with dual-layer buffered fibers around a dielectric central element, with a flame-retardant jacket in compliance with NEC 770.

[Specifier Notes] – Retain one of the following seven paragraphs to meet project requirements.

* + - * 1. Fiber Count: Two (2) single-layer fibers.
				2. Fiber Count: Four (4) single-layer fibers.
				3. Fiber Count: Six (6) single-layer fibers.
				4. Fiber Count: Eight (8) single-layer fibers.
				5. Fiber Count: Twelve (12) dual-layer fibers.
				6. Fiber Count: Sixteen (16) dual-layer fibers.
				7. Fiber Count: Twenty-four (24) dual-layer fibers.
		1. Indoor Unitized Tight-Buffered 36- to 144-Fibers Riser Cables.

[Specifier Notes] – Retain the following paragraph if this document is a PROPRIETARY Specification, with Corning Optical products listed as the Basis of Design. Delete if not required.

* + - 1. Basis of Design Product: MIC Unitized Tight Buffered, Riser, by Corning Optical.
			2. Riser Flame and Smoke: Provide cable in compliance with UL 1666.
			3. Color: Cable jacket available in up to 12 colors.
			4. Physical Performance: Provide cable with buffered fibers around a dielectric central element, with a flame-retardant jacket in compliance with NEC 770.

[Specifier Notes] – Retain one of the following six paragraphs to meet project requirements.

* + - * 1. Fiber Count: Thirty-six (36) fibers in six (6) subunits.
				2. Fiber Count: Forty-eight (48) fibers in six (6) subunits.
				3. Fiber Count: Sixty (60) fibers in twelve (12) subunits.
				4. Fiber Count: Seventy-two (72) fibers in twelve (12) subunits.
				5. Fiber Count: Ninety-six (96) fibers in twenty-four (24) subunits.
				6. Fiber Count: One hundred forty-four (144) fibers in twenty-four (24) subunits.
		1. Indoor Armored Unitized Tight-Buffered 36- to 144-Fibers Riser Cables.

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* + - 1. Basis of Design Product: MIC Tight Buffered, Interlocking Armored, Riser, by Corning Optical.
			2. Riser Flame and Smoke: Provide cable in compliance with UL 1666.
			3. Core Protection: Flexible, spirally wrapped, aluminum interlocking armor.
			4. Color: Cable jacket available in up to 12 colors.
			5. Physical Performance: Provide cable with buffered fibers around a dielectric central element, with a flame-retardant jacket in compliance with NEC 770.

[Specifier Notes] – Retain one of the following six paragraphs to meet project requirements.

* + - * 1. Fiber Count: Thirty-six (36) fibers in six (6) subunits.
				2. Fiber Count: Forty-eight (48) fibers in six (6) subunits.
				3. Fiber Count: Sixty (60) fibers in twelve (12) subunits.
				4. Fiber Count: Seventy-two (72) fibers in twelve (12) subunits.
				5. Fiber Count: Ninety-six (96) fibers in twenty-four (24) subunits.
				6. Fiber Count: One hundred forty-four (144) fibers in twenty-four (24) subunits.
		1. Indoor Unitized Tight-Buffered 36- to 144-Fibers Plenum Cables.

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* + - 1. Basis of Design Product: MIC Tight Buffered, Plenum, by Corning Optical.
			2. Plenum Flame and Smoke: Provide cable in compliance with NFPA 262.
			3. Color: Cable jacket available in up to 12 colors.
			4. Physical Performance: Provide cable buffered fibers around a dielectric central element, with a flame-retardant jacket in compliance with NEC 770.

[Specifier Notes] – Retain one of the following six paragraphs to meet project requirements.

* + - * 1. Fiber Count: Thirty-six (36) fibers in six (6) subunits.
				2. Fiber Count: Forty-eight (48) fibers in six (6) subunits.
				3. Fiber Count: Sixty (60) fibers in twelve (12) subunits.
				4. Fiber Count: Seventy-two (72) fibers in twelve (12) subunits.
				5. Fiber Count: Ninety-six (96) fibers in twenty-four (24) subunits.
				6. Fiber Count: One hundred forty-four (144) fibers in twenty-four (24) subunits.
		1. Indoor Armored Unitized Tight-Buffered 36- to 144-Fibers Plenum Cables.

[Specifier Notes] – Retain the following paragraph if this document is a PROPRIETARY Specification, with Corning Optical products listed as the Basis of Design. Delete if not required.

* + - 1. Basis of Design Product: MIC Tight Buffered, Interlocking Armored, Plenum, by Corning Optical.
			2. Plenum Flame and Smoke: Provide cable in compliance with NFPA 262.
			3. Core Protection: Flexible, spirally wrapped, aluminum interlocking armor.
			4. Color: Cable jacket available in up to 12 colors.
			5. Physical Performance: Provide 31.3 mm (1.23 in) diameter cable with one hundred forty-four (144) twenty-four (24) buffered fibers around a 6.80 mm (0.27 in) dielectric central element, with a flame-retardant jacket in compliance with NEC 770.

[Specifier Notes] – Retain one of the following six paragraphs to meet project requirements.

* + - * 1. Fiber Count: Thirty-six (36) fibers in six (6) subunits.
				2. Fiber Count: Forty-eight (48) fibers in six (6) subunits.
				3. Fiber Count: Sixty (60) fibers in twelve (12) subunits.
				4. Fiber Count: Seventy-two (72) fibers in twelve (12) subunits.
				5. Fiber Count: Ninety-six (96) fibers in twenty-four (24) subunits.
				6. Fiber Count: One hundred forty-four (144) fibers in twenty-four (24) subunits.
	1. DIELECTRIC ARMORED tight buffered FIBER OPTIC CABLES

Specifier Notes – For more information about dielectric armored tight buffer fiber optic cables in this article see: https://www.corning.com/catalog/coc/documents/generic-specifications/PGS091.pdf

* + 1. General Requirements: Provide fiber optic cables that meet the following requirements when tested in accordance with the testing requirements in this section.
			1. Attenuation: Fiber optic cables shall not exceed the following change in attenuation:
				1. Single mode: 0.4 dB at 1550 nm.
				2. Multimode: 0.6 dB at 1300 nm.
			2. Jacket shall not crack, split, or tear.
			3. No mechanical damage to fibers.
		2. Testing Requirements:
			1. Temperature Cycling: FOTP-3.
				1. Storage: -40 °C to 70 °C (-40 °F to 158 °F).
				2. Installation: -10 °C to 60 °C (14 °F to 140 °F).
				3. Operation: -20 °C to 70 °C (-4 °F to 158 °F).
			2. Crush Resistance: FOTP-41.
				1. Force: 100 N/cm (57 lbf/in).
			3. Cyclic Flexing: FOTP-104.
			4. Bending: FOTP-37.
			5. Impact Resistance: FOTP-25.
				1. Impact Energy: 2.94 N⋅m (26.38 in⋅lbf).
			6. Twisting: FOTP-85.
			7. Tensile and Fiber Strain: FOTP-33.
				1. Cables under 12 feet (3.7 m): 660 N (148 lbf).
				2. Cables over 12 feet (3.7 m): 1320 N (297 lbf).
		3. Indoor Dielectric Armored Tight-Buffered 6- to 12-Fibers Plenum Cables.

[Specifier Notes] – Retain the following paragraph if this document is a PROPRIETARY Specification, with Corning Optical products listed as the Basis of Design. Delete if not required.

* + - 1. Basis of Design Product: MIC DX Tight Buffered Armored, Plenum, by Corning Optical.
			2. Plenum Flame and Smoke: Provide cable in compliance with NFPA 262.
			3. Core Protection: Dielectric armor.
			4. Color: Cable jacket available in up to 12 colors.
			5. Physical Performance: Provide cable with buffered fibers around a dielectric central element, with a flame-retardant jacket in compliance with NEC 770.
				1. Fiber Count: Six (6) fibers.
				2. Fiber Count: Twelve (12) fibers.
				3. Fiber Count: Twenty-four (24) fibers.
1. EXECUTION
	1. EXAMINATION
		1. Verification of Conditions: Do not begin installation until substrates have been properly prepared.
		2. Evaluation and Assessment: If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Surface Preparation: Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install all products in this section following the product manufacturer’s published installation and application manuals and guidelines.
	4. FIELD QUALITY CONTROL
		1. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.
			1. Inspections: Fiber optic cables, accessories, and installation are subject to inspection for compliance with requirements and photograph documentation of conditions to be concealed by subsequent Work.
		2. Tests: As determined by Owner's testing agency from among the following tests:
			1. Optical Fiber Cabling Components: Test in accordance with ANSI/TIA 568.3-D.
			2. Optical Power Loss: Test in accordance with ANSI/TIA-526-14-C.
			3. <<INSERT REQUIRED FIELD TESTS>>
		3. Fiber optic cable will be considered defective if it does not pass tests and inspections.
	5. PROTECTION
		1. Protect installed products until substantial completion, replace damaged materials and retest.

End of Section