

Fiber Optic Cable, Indoor

Fiber optic cable consists of strands of fiber, which permit digital data transmission, and other elements necessary to protect the fibers from external influence.

When choosing a cable, one should pay special attention to fire safety standards. This is of especially high importance for indoor uses. A Flame retardant jacket ensures safe storage, installation and operation of the cable.

Fiber optic cable is designed for underground use in trenches, lashing to aerial telephone poles, for installation in tunnels and collectors, and for inter and intra building needs. Depending on the application, fiber optic cable is divided into the following types:

- outdoor
- indoor
- indoor/outdoor.

An optical fiber is rather sensitive to external influence, therefore the fiber is surrounded by an acrylate-based cladding layer (60 µm) for its protection. Other materials can also be used for fiber coating. Generally, fiber is the main element of the fiber optic cable. Nominal fiber diameter with a tough resin buffer layer is 245 µm.

Naturally, such coating cannot always resist external influence. Therefore optical fiber needs additional protection. For protection of main outdoor cable, such materials as polyethylene and polybutylene terephthalate are used for construction of a jacket layer of different diameters. For indoor application, the jacketed fiber is generally enclosed in a tight buffer with an outer diameter 0.035"± 0.004" (0.9±0.1 mm). In comparison with loose-tube construction, a small diameter of tight buffer and absence of hydrophobic filling (gel) provides easier mounting of a connection plug. However, tight buffer doesn't protect the fiber from moisture, which results in increasing of the attenuation due to losses at microbendings, caused by mechanical deformation of the fiber. Tight buffer is used mainly in order to make cable flexible or to allow it to be easily terminated with a fiber optic connector.

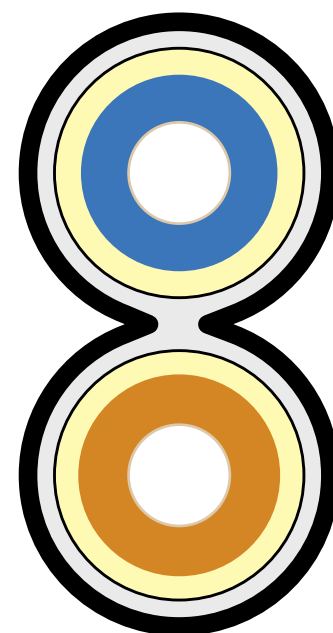
Fiber optic cables come in a variety of semi-rigid coatings, including micromodular constructions known as loose tubes. The outer diameter of a tube is 0.035" (0.9 mm). The fiber is laid helically into semi-rigid tubes, allowing the cable to stretch without stretching the fiber itself. It protects the fiber from tension and moisture, thus reducing losses caused by microbendings. Moreover, when using a semi-rigid type of coating, there is a possibility of stripping a longer piece of cable during the cable termination.

Fiber Optic Cable, Indoor, Zip-cord, 2 fibers

FO-ZIP-IN-XX-2-FRPVC



Specifications	The cable meets EIA-TIA 455 and IEC-60794 Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic cable, multi-mode, zip-cord, 2 fibers General purpose: indoor LAN cable The cable is designed for patch-cords. The cable is suitable for installation in a work area Short distance data transmission and termination of fiber optic connector
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: tight buffer Armoring and waterproofing: dielectric aramid strength yarns Outer jacket: flame-retardant PVC (polyvinylchlorid)
Technical characteristics	Fiber diameter: 125 ± 1 µm Fiber diameter with a buffer layer: 242 ± 7 µm Jacketed fiber diameter: 0.035" (0.9 mm) Cable dimensions: 0.11"x0.23" (2.8x6.0 mm) Winding tension: 0.7 GPa/s Shrinking of fiber covering strength: 1.3 – 8.9 H Fiber coating out-of-roundness: 1% max Min bend radius during installation: 1.65" (42 mm) Min bend radius during operation: 1.1" (28 mm) Repeated Bending: 10.000 bends Max tensile strength during installation: 450 N Max tensile strength during operation: 250 N Max crush resistance: 558.8 N/in (220 N/cm) Impact resistance: 0.46 N/ft (1.5 N/m) Flexing stability: 1000 cycles Installation temperature: +23°F to +122°F (– 5°C to +50°C) Operating temperature: –13°F to +167°F (– 25°C to +75°C) Storage temperature: –13°F to +167°F (– 25°C to +75°C) Weight per 1000 ft: 33.95 lbs (15.4 kg) Standard cable coil: 3280.84 ft (1000 m)
Ordering information	FO-ZIP-IN-XX-2-FRPVC (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125) Fiber Optic Cable, multimode, indoor, zip-cord, 2 fibers

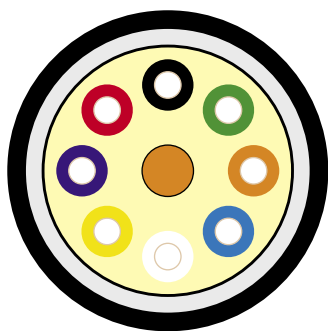


Schematic symbols:

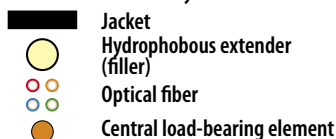
 Jacket
 Hydrophobous extender (filler)
 Optical fiber

Fiber Optic Cable, Tight Buffer, Indoor

FO-D-IN-XX-YY-FRPVC



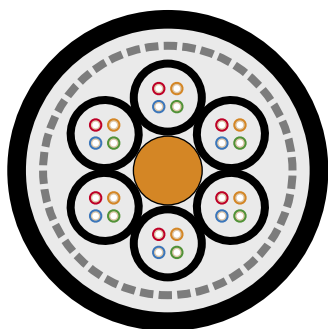
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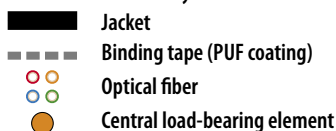
Specifications	The cable meets EIA-TIA 455 and IEC-60794, 60332-3 Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic cable, tight buffer, 2–24 fibers General purpose: indoor LAN cable The cable is used for SCS building as a main and a horizontal cable The cable maintains short and long distance data transmission The cable is used for horizontal cabling
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: tight buffer Armoring and waterproofing: dielectric aramid strength yarns Outer jacket: flame-retardant PVC (polyvinylchlorid)
Technical characteristics	Fiber diameter: 125 ± 1 μm Fiber diameter with a buffer layer: 242 ± 7 μm Jacketed fiber diameter: 0.035" (0.9 mm) Cable dimensions: 0.18"/0.24" (4.5/6.0 mm) Min bend radius during installation: 2.7"/2.9" (68/74 mm) Min bend radius during operation: 1.8"/1.9" (45/50 mm) Max tensile strength during installation: 900 N Max tensile strength during operation: 540 N Max crush resistance: 762 N/in (300 N/cm) Operating temperature: –13°F to +167°F (–25°C to +75°C) Weight per 1000 ft: 37.47/44 lbs (17/20 kg) Standard cable coil: 3280.84 ft (1000 m)
Ordering information	FO-D-IN-XX-YY-FRPVC (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125; YY – 2 to 24 fibers) Fiber optic cable, tight buffer, indoor

Fiber Optic Breakout Cable, Multi Loose Tube, Indoor

FO-MT-IN-XX-YY-FRPVC



Schematic symbol:



Specifications	The cable meets ISO-9001, EIA/TIA 455, IEC-60794 Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic breakout cable, multi loose tube, 2–24 fibers General purpose all-dielectric indoor LAN cable Backbone and riser indoor cabling Short distance routing and termination of fiber optic connector
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: polybutylene terephthalate module (loose tube) Armoring and waterproofing: waterproofing tape Module filler: filled with thixotropic gel which protects from water corrugation Outer jacket: flame-retardant PVC (polyvinylchlorid) Central strength member: dielectric load-bearing element
Technical characteristics	Fiber diameter: 125 ± 1 μm Fiber diameter with a buffer layer: 242 ± 7 μm Jacketed fiber diameter: 0.08" (2.1 mm) Cable dimensions: 0.25"/0.28" (6.4/7.2 mm) Min bend radius during installation: 3.78"/4.25" (96/108 mm) Min bend radius during operation: 2.52"/2.83" (64/72 mm) Max tensile strength during installation: 500 N Max tensile strength during operation: 300 N Max crush resistance: 558.8 N/in (220 N/cm) Operating temperature: –13°F to +167°F (–25°C to +75°C) Weight per 1000 ft: 86/117 lbs (39/53 kg)
Ordering information	FO-MT-IN-XX-YY-FRPVC (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125; YY – to 24 fibers) Fiber optic breakout cable, multi loose tube, indoor

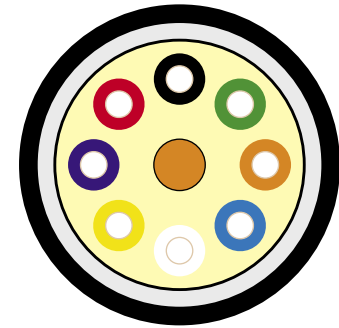
Fiber Optic Cable, Indoor/Outdoor

Fiber Optic Cable, Tight Buffer, Indoor/Outdoor

FO-D-IN/OUT-XX-YY-HFFR



Specifications	The cable meets EIA-TIA 455 and IEC- 60332, 60754, 60794 Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic cable, tight buffer, 2–72 fibers General purpose: all-dielectric Indoor/Outdoor LAN cable
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: tight buffer Armoring and waterproofing: dielectric aramid strength yarns Outer jacket: UV-resistant Halogen Free and Flame Retardant compound (HFFR) Central strength member: dielectric load-bearing element
Technical characteristics	Fiber diameter: 125 ± 1 μm Fiber diameter with a buffer layer: 242 ± 7 μm Jacketed fiber diameter: 0.035" (0.9 mm) Cable dimensions: 10.8" (4.9 mm) Min bend radius during installation: 216" (98 mm) Min bend radius during operation: 108" (49 mm) Max tensile strength during installation: 900 N Max tensile strength during operation: 540 N Max crush resistance: 558.8 N/in (220 N/cm) Operating temperature: -40°F to +158°F (- 40°C to +70°C) Weight per 1000 ft: 55.11 lbs (25 kg)
Ordering information	FO-D-IN/OUT-XX-YY-HFFR (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125; YY – 2 to 24 fibers) Fiber optic cable, tight buffer, indoor/outdoor

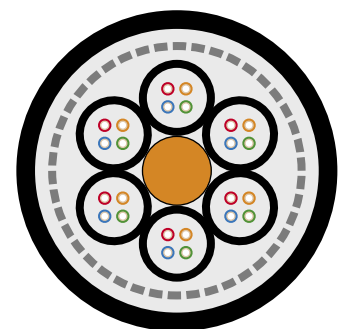


- Schematic symbol:**
- Jacket
 - Hydrophobous extender (filler)
 - Optical fiber
 - Central load-bearing element

Fiber Optic Breakout Cable, Multi Loose Tube, Indoor/Outdoor

FO-MT-IN/OUT-XX-YY-HFFR

Specifications	The cable meets EIA/TIA 455 and IEC- 60794, ISO-9001 Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic breakout cable, multi loose tube, 2–24 fibers General purpose: all-dielectric Indoor/Outdoor LAN cable Campus and building backbone and riser cabling Inter and Intra-building routing and termination of fiber optic connector
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: polybutylene terephthalate module (loose tube) Armoring and waterproofing: waterproofing tape Module filler: filled with thixotropic gel which protects from water corrugation Outer sheathing: UV-resistant halogen free and flame retardant compound (HFFR) Central strength member: dielectric load-bearing element
Technical characteristics	Fiber diameter: 125 – 1 μm Fiber diameter with a buffer layer: 242 ± 7 μm Jacketed fiber diameter: 0.08" (2.1 mm) Cable dimensions: 0.34"/0.43"/0.15" (8.8/10.9/3.9 mm) Min bend radius during installation: 5.12"/5.7"/7.67" (130/145/195 mm) Min bend radius during operation: 3.46"/3.82"/5.12" (88/97/130 mm) Max tensile strength during installation: 1500 N Max tensile strength during operation: 900 N Max crush resistance: 1117.6 N/in (440 N/cm) Operating temperature: -40°F to +167°F (- 40°C to +75°C) Weight per 1000 ft: 160.9/253.5/385.8 lbs (73/115/175 kg)
Ordering information	FO-MT-IN/OUT-XX-YY-HFFR (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125; YY – 2 to 96 fibers) Fiber Optic breakout cable, multi loose tube, indoor/outdoor

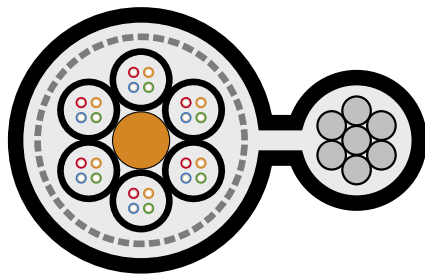


- Schematic symbol:**
- Jacket
 - Binding tape (PUF coating)
 - Optical fiber
 - Central load-bearing element

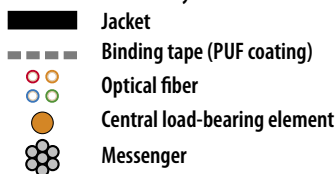
Fiber Optic Cable, Outdoor

Fiber Optic Cable, Multi Loose Tube, Self-supported, with Messenger

FO-SSMT-OUT-XX-YY-PE



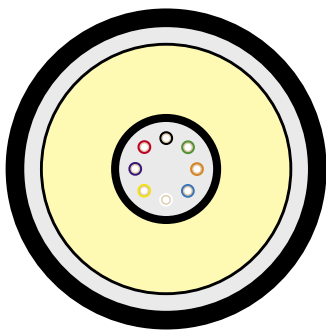
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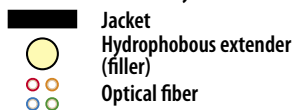
Specifications	The cable meets EIA/TIA-455 and IEC-60794-1, ISO-9001:2000, EIA/TIA-598 Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic cable, multi loose tube, 2–24 fibers, self-supported, with messenger The cable is used for outdoor long-distance cabling within telephone systems. The cable supports transmission of cable television signals, as well as data transmission Outdoor conduit and aerial installation
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: polybutylene terephthalate module (loose tube) Armoring and waterproofing: waterproofing tape Module filler: filled with thixotropic gel which protects from water corrugation Outer sheathing: UV-resistant polyethylene Messenger: steel wire Central strength member: dielectric load-bearing element
Technical characteristics	Fiber diameter: $125 \pm 1 \mu\text{m}$ Fiber diameter with a buffer layer: $242 \pm 7 \mu\text{m}$ Cable dimensions: 0.44" x 0.88"/0.46" x 0.9" (11.3 x 22.3/11.8 x 22.8 mm) Winding tension: 0.7 GPa/s Shrinking of fiber covering strength: 1.3–8.9 N Max tensile strength during installation: 8000 N Max tensile strength during operation: 1000 N Max crush resistance: 2540 N/in (1000 N/cm) Operating temperature: -40°F to $+158^{\circ}\text{F}$ (-40°C to $+70^{\circ}\text{C}$) Weight per 1000 ft: 606.27/650.36 lbs (275/295 kg)
Ordering information	FO-SSMT-OUT-XX-YY-PE (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125; YY – 2 to 24 fibers) Fiber optic cable, outdoor, multi loose tube, self-supported, with messenger

Fiber Optic Cable, Single Loose Tube, Outdoor

FO-ST-OUT-XX-YY-PE



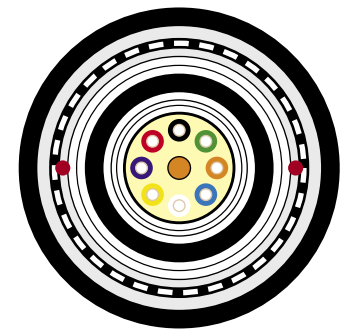
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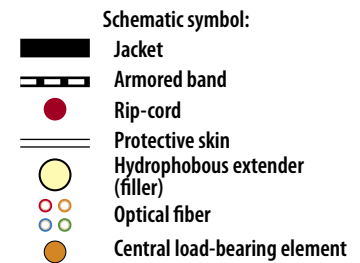
Specifications	The cable meets EIA/TIA-455, IEC-60794, IEC-60794-1-F5 and EIA/TIA FOTP 82B Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic cable, single loose tube, 2–24 fibers General purpose cable for LAN and outdoor cabling Backbone cabling
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: polybutylene terephthalate module (loose tube) Armoring and waterproofing: waterblocking aramid strength yarns Module filler: filled with thixotropic gel which protects from water corrugation Outer sheathing: UV-resistant polyethylene
Technical characteristics	Fiber diameter: $125 \pm 1 \mu\text{m}$ Fiber diameter with a buffer layer: $242 \pm 7 \mu\text{m}$ Jacketed fiber diameter: 0.08" (2.1 mm) Cable dimensions: 0.29" (7.3 mm) Min. Bend radius during installation: 5.75" (146 mm) Min. Bend radius during operation: 2.87" (73 mm) Max. Tensile strength during installation: 2700 N Max. Tensile strength during operation: 1600 N Max. Crush resistance: 1117.6 N/in (440 N/cm) Operating temperature: -40°F to $+158^{\circ}\text{F}$ (-40°C to $+70^{\circ}\text{C}$) Weight per 1000 ft: 110.23 lbs (50 kg)
Ordering information	FO-ST-OUT-XX-YY-PE (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125; YY – 2 to 24 fibers) Fiber optic cable, single loose tube, outdoor

Fiber Optic Cable, Outdoor, with Tight Buffer, Armored with Steel Band, Waterproof

FO-AD-OUT-XX-YY-ARM

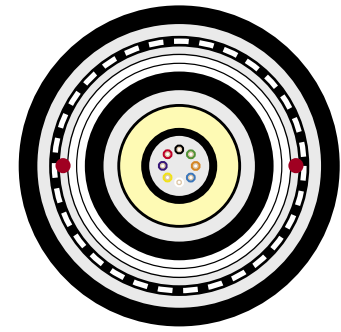
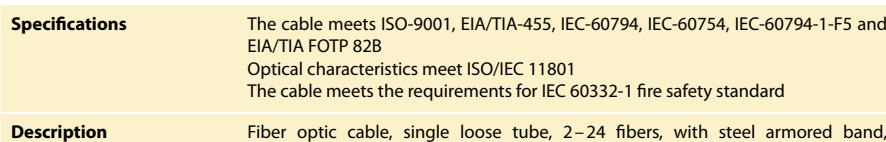


Specifications	The cable meets EIA/TIA-455, IEC-60794, IEC-60794 and EIA/TIA FOTP 82B Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic cable, with tight buffer, 2–72 fibers, armored with steel band, waterproof The cable is used for the outdoor cabling and SCS building The cable may be installed in cable ducts and is suitable for underground cabling
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: polybutylene terephthalate module (loose tube) Armoring and waterproofing: waterblocking aramid strength yarns Outer sheathing: UV-resistant polyethylene Armor: corrugated steel band
Technical characteristics	Fiber diameter: 125 ± 1 µm Fiber diameter with a buffer layer: 242 ± 7 µm Jacketed fiber diameter: 0.035" (0.9 mm) Cable dimensions: 0.43"/0.44"/0.48"/0.61" (11/11.2/12.2/15,5 mm) Min bend radius during installation: 8.66"/9.05"/9.6"/12.2" (220/230/244/310 mm) Min bend radius during operation: 8.66"/9.05"/9.6"/12.2" (220/230/244/310 mm) Max tensile strength during installation: 2700 N Max tensile strength during operation: 1600 N Max crush resistance: 2032 N/in (800 N/cm) Operating temperature: -40°F to +158°F (-40°C to +70°C) Weight per 1000 ft: 297.62/308.64/352.74/555.56 lbs (135/140/160/252 kg)
Ordering information	FO-AD-OUT-XX-YY-ARM (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125; YY – 2 to 72 fibers) Fiber optic cable, outdoor, with tight buffer, armored with steel band, waterproof

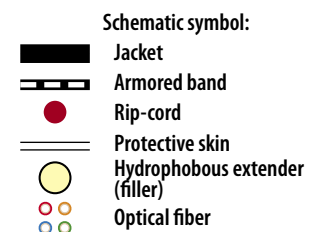


Fiber Optic Cable, Outdoor, Single Loose Tube, Armored with Steel Band, Waterproof

FO-AST-OUT-XX-YY-PE

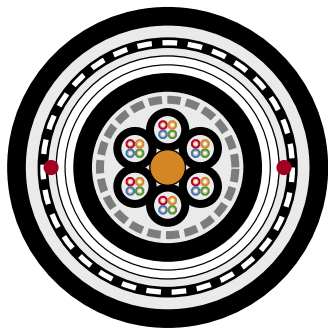


Specifications	The cable meets ISO-9001, EIA/TIA-455, IEC-60794, IEC-60754, IEC-60794-1-F5 and EIA/TIA FOTP 82B Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic cable, single loose tube, 2–24 fibers, with steel armored band, waterproof General purpose cable for LAN and outdoor cabling Backbone cabling Suitable for underground cabling
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: polybutylene terephthalate module (loose tube) Armoring and waterproofing: waterblocking aramid strength yarns Module filler: filled with thixotropic gel which protects from water corrugation Outer sheathing: UV-resistant polyethylene Armor: corrugated steel band
Technical characteristics	Fiber diameter: 125 ± 1 µm Fiber diameter with a buffer layer: 242 ± 7 µm Jacketed fiber diameter: 0.08" (2.1 mm) Cable dimensions: 0.47" (11.9 mm) Min bend radius during installation: 9.37" (238 mm) Min bend radius during operation: 9.37" (238 mm) Max tensile strength during installation: 2700 N Max tensile strength during operation: 1600 N Max crush resistance: 2032 N/in (800 N/cm) Operating temperature: -40°F to +158°F (-40°C to +70°C) Weight per 1000 ft: 330.7 lbs (150 kg)
Ordering information	FO-AST-OUT-XX-YY-PE (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125; YY – 2 to 24 fibers) Fiber optic cable, outdoor, single loose tube, armored with steel band, waterproof

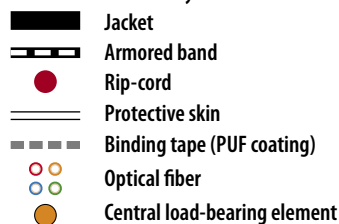


Fiber Optic Cable, Outdoor, Multi Loose Tube, Armored with Steel Band, Waterproof

FO-AMT-OUT-XX-YY-PE



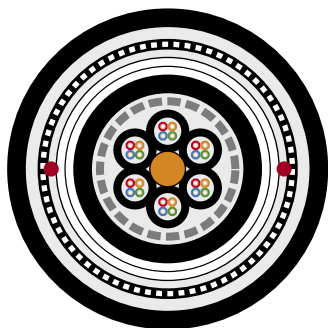
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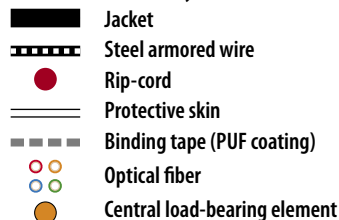
Specifications	The cable meets EIA/TIA-455, IEC-60794-1, ISO-9001:2000 and EIA/TIA-598 Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic cable, multi loose tube, 2–96 fibers, with steel armored band, waterproof The cable is used for outdoor long-distance cabling within telephone systems The cable supports transmission of cable television signals as well as data transmission The cable may be installed in cable ducts and is suitable for underground cabling
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: polybutylene terephthalate module (loose tube) Armoring and waterproofing: waterproofing tape Module filler: filled with thixotropic gel which protects from water corrugation Outer sheathing: UV-resistant polyethylene Armor: corrugated steel band Central strength member: dielectric load-bearing element
Technical characteristics	Fiber diameter: $125 \pm 1 \mu\text{m}$ Fiber diameter with a buffer layer: $242 \pm 7 \mu\text{m}$ Jacketed fiber diameter: 0.08" (2.1 mm) Cable dimensions: 0.55"/0.61"/0.66"/0.74"/0.85" (14/15.7/16.8/18.9/21.5 mm) Max tensile strength during installation: 3000 N Max tensile strength during operation: 1000 N Max crush resistance: 7620 N/in (3000 N/cm) Operating temperature: -40°F to $+158^{\circ}\text{F}$ (-40°C to $+70^{\circ}\text{C}$) Weight per 1000 ft: 463/560/652.56/776/926 lbs (210/254/296/352/420 kg)
Ordering information	FO-AMT-OUT-XX-YY-PE (XX-50 – fiber 50/125; 62 – fiber 62.5/125; 9 – fiber 9/125; YY – 2 to 96 fibers) Fiber optic cable, outdoor, multi loose tube, armored with steel band, waterproof

Fiber Optic Cable, Outdoor, Multi Loose Tube, with Steel Armored Wire, Waterproof

FO-AWMT-OUT-XX-YY-PE



Schematic symbol:



Specifications	The cable meets EIA/TIA 568-B for category 3 Optical characteristics meet ISO/IEC 11801 The cable meets the requirements for IEC 60332-1 fire safety standard
Description	Fiber optic cable, multi loose tube, 2–96 fibers, with steel armored wire, waterproof The cable is used for laying under the ground, for installation in cable ducts, tubes, cable blocks The cable is designed for heavy-duty operating conditions, in often-flooded areas The cable is installed in tunnels and collectors, on bridges and elevated roads
Materials	Conductive material: optical fiber 9/125, 50/125, 62.5/125 Fiber insulation: polybutylene terephthalate module (loose tube) Armoring and waterproofing: waterproofing tape Module filler: filled with thixotropic gel which protects from water corrugation Outer sheathing: UV-resistant polyethylene Armor: corrugated steel wire Central strength member: dielectric load-bearing element
Technical characteristics	Fiber diameter: $125 \pm 1 \mu\text{m}$ Fiber diameter with a buffer layer: $242 \pm 7 \mu\text{m}$ Jacketed fiber diameter: 0.08" (2.1 mm) Cable dimensions: 0.63" (16 mm) Min bend radius during installation: 20 outer diameters Max tensile strength during installation: 7000 N Max tensile strength during operation: 3200 N Max crush resistance: 1524N/in (600 N/cm) Operating temperature: -76°F to $+158^{\circ}\text{F}$ (-60°C to $+70^{\circ}\text{C}$) Weight per 1000 ft: 1058.21 lbs (480 kg)
Ordering information	FO-AWMT-OUT-XX-YY-PE (XX-50 – fiber 50/125; 62 – iber 62.5/125; 9 – fiber 9/125; YY – 2 to 96 fibers) Fiber optic cable, outdoor, multi loose tube, with steel armored wire, waterproof