OUTDOOR CABLES

OPTICAL CABLE CORPORATION

FIBER OPTIC CABLE

OUTDOOR

CST & FRP Armor

Applications

- Ideal for installation where direct-burial or rodent protection is required
- Corrugated Steel Tape (CST)
- Fiberglass Rodent Protection (FRP)

Features

- The steel armor is easily removed with an internal ripcord, leaving a fully functional intact inner cable, with original cable markings for identification.
- UL Listed OFCR cables with riser-rated outer armor jackets are available as an option for greater ease of installation. This feature eliminates the need to splice the outdoor cable to the indoor cable within 50 feet of the building entrance
- Armored jacket is an add-on option which can be applied to most outdoor and indoor/outdoor riser-rated or plenum-rated cables
- Inner tight-buffered cable is suitable for direct field termination with standard optical connectors
- Optional all-dielectric fiberglass yarn armor (FRP) available as a rodent protection deterrent where dielectric properties, lightweight and flexibility are primary requirements of the cable.
  Fiberglass Yarn Armor Benefits:
  (1) FRP provides an effective deterrent to damage caused by small, non-burrowing rodents (not recommended for direct burial applications)
  (2) FRP is ideal for use where cable is exposed in subterranean tunnels, ducts and surface installations
- Please contact Optical Cable Corporation for complete FRP specifications

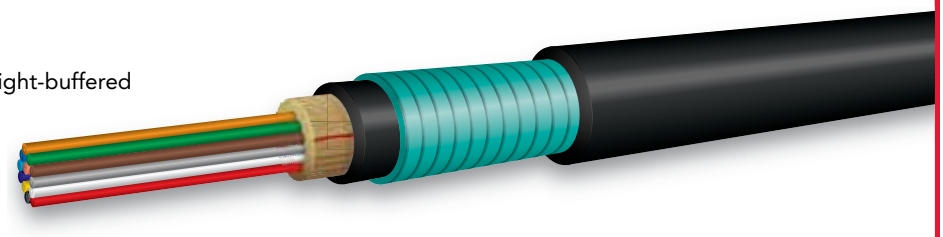
Mechanical and Environmental Performance

Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +85°C
Installation Temperature (cable temp.)	-10°C to +60°C
Impact Resistance:	20 Impacts
Crush Resistance:	650 N/cm

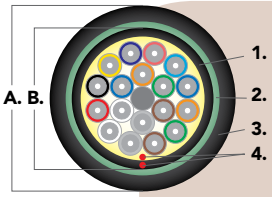
Applicable Standards

Optical Cable Corporation CST armored tight-buffered fiber optic cables meet the functional requirements of the following standards

- TIA-568
- TIA-598
- GR-20-CORE
- ICEA S-104-696
- ICEA S-87-640



Corrugated Steel Armor/Polyethylene Overjacket Construction for Rodent Deterance



A. Overall Cable Diameter
B. Outside Diameter of Jacketed Inner Cable

1. Jacketed Inner DX-Series Distribution Cable
2. Steel Tape Armor
3. Polyethylene Outer Jacket
4. Ripcords

Cable Characteristics: CST Armored Cables (using Distribution Series Riser Inner-cable)

Fiber Count	Diameter (armored) mm (in)	Weight (armored) kg/km (lbs/1,000')	Installation Tensile Load N (lbs)	Operational Tensile Load N (lbs)	Minimum Bend Radius Installation cm (in)	Minimum Bend Radius Long-Term cm (in)
2	11.0 (0.43)	107 (71)	1,400 (310)	450 (100)	16.5 (6.5)	11.0 (4.3)
4	11.0 (0.43)	107 (71)	1,400 (310)	450 (100)	16.5 (6.5)	11.0 (4.3)
6	11.0 (0.43)	107 (71)	1,400 (310)	450 (100)	16.5 (6.5)	11.0 (4.3)
8	11.0 (0.43)	117 (78)	1,600 (360)	525 (120)	16.5 (6.5)	11.0 (4.3)
10	12.0 (0.47)	138 (92)	1,800 (600)	600 (135)	18.0 (7.1)	12.0 (4.7)
12*	11.0 (0.43)	128 (86)	2,700 (600)	600 (135)	16.5 (6.5)	11.0 (4.3)
18	12.0 (0.47)	143 (96)	2,700 (600)	700 (160)	18.0 (7.1)	12.0 (4.7)
24	14.0 (0.55)	177 (118)	3,000 (670)	1,000 (220)	21.0 (8.3)	14.0 (5.5)
30	13.5 (0.53)	184 (123)	3,000 (670)	1,000 (220)	20.3 (8.0)	13.5 (5.3)
36	14.0 (0.55)	188 (126)	3,000 (670)	1,000 (220)	21.0 (8.3)	14.0 (5.5)
48	15.5 (0.61)	220 (147)	4,200 (940)	1,400 (310)	23.3 (9.2)	15.5 (6.1)
60	19.0 (0.75)	300 (201)	4,800 (1,080)	1,600 (360)	28.5 (11.2)	19.0 (7.5)
72	20.0 (0.79)	346 (232)	5,400 (1,210)	1,800 (400)	30.0 (11.8)	20.0 (7.9)
84	21.0 (0.83)	348 (233)	6,000 (1,350)	2,000 (450)	31.5 (12.4)	21.0 (8.3)
96	22.0 (0.87)	413 (277)	6,000 (1,350)	2,000 (450)	33.0 (13.0)	22.0 (8.7)
108	23.5 (0.93)	452 (303)	6,000 (1,350)	2,000 (450)	35.3 (13.9)	23.5 (9.3)
120	25.0 (0.98)	505 (339)	6,000 (1,350)	2,000 (450)	37.5 (14.8)	25.0 (9.8)
132	25.0 (0.98)	525 (352)	6,000 (1,350)	2,000 (450)	37.5 (14.8)	25.0 (9.8)
144	27.0 (1.06)	609 (409)	6,000 (1,350)	2,000 (450)	40.5 (15.9)	27.0 (10.6)

**62.5 µm multimode fiber. Mechanical specifications vary by fiber type.*
Installation loads in excess of 2,700 N (600 lbs.) are not recommended.
Other fiber counts available upon request.

See application engineering note:
Interlocking Armor Cable Pulling Grip Installation Procedure available online at www.occfiber.com.

Laser Ultra-Fox™ Fiber Performance

Fiber Code	Core/Cladding Diameter (µm)	Wavelength (nm)	Industry Standard Designation	Gigabit Ethernet Distance (m)	10-Gigabit Ethernet Distance (m)	Maximum Cabled Attenuation (dB/km)	Minimum Laser Bandwidth (MHz-km)	Minimum LED Bandwidth* (MHz-km)
WLS	62.5/125 Standard	(850/1310)	OM1 ISO/IEC 11801	300/600	33/300^	3.5/1.5	220/500	200/500
WLX	62.5/125 XL	(850/1310)	OM1 ISO/IEC 11801	500/1000	33/300^	3.0/1.0	385/500	200/500
ALS	50/125 Standard	(850/1310)	OM2 ISO/IEC 11801	600/600	82/300^	3.5/1.5	510/500	500/500
ALX	50/125 XL	(850/1310)	OM2 ISO/IEC 11801	750/600	150/300^[2]	3.0/1.0[3]	950/500	700/500
ALT	50/125 (300 meter 10-GbE)	(850/1310)	OM3 ISO/IEC 11801	1000/600	300/300^[2]	3.0/1.0[3]	2000/500	1500/500
ALE	50/125 (550 meter 10-GbE)	(850/1310)	OM3 ISO/IEC 11801	1040/600	550[1]/300^[2]	3.0/1.0[3]	4700/500	3500/500
SLX	9[6]/125 Low Water Peak Single-mode	(1310/1550)	ITU-T G.652.D	5 km[4]	10 km[5]	0.5/0.5	—	—
SLA	9[6]/125 Bend-Insensitive Single-mode	(1310/1550)	ITU-T G.657.A ITU-T G.652.D	5 km[4]	10 km[5]	0.5/0.5	—	—
SLB	9[6]/125 Bend-Insensitive Single-mode	(1310/1550)	ITU-T G.657.A & B ITU-T G.652.D	5 km[4]	10 km[5]	0.5/0.5	—	—

Ordering Information

	D	**X**				**D**				**9**	**K**	**A**	**A**	**2**
Digit No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 – 2 Distribution Series CST Armor Ultra-Fox™= **DX**
3 – 5 Fiber count: (See Cable Characteristics Chart) = **002 - 144**
6 Jacket type: Riser (inner cable) = **D**
7 – 9 Fiber type: (See Laser Ultra-Fox™ Fiber Performance Table)
10 250 micron fiber with 900 micron tight buffer = **9**
11 Jacket Color: Black = **K**
12 Rating: None/Outdoor = **A**
13 – 14 Armor Code:
Corrugated Steel Tape with polyethylene over jacket = **A2**

Example: 12 fiber CST armored Distribution cable using 62.5 µm standard laser optimized fiber, black jacket –

D	**X**	**0**	**1**	**2**	**D**	**W**	**L**	**S**	**9**	**K**	**A**	**A**	**2**

12 fiber CST armored Breakout cable using 62.5 µm standard laser optimized fiber, black jacket –

B	**X**	**0**	**1**	**2**	**D**	**W**	**L**	**S**	**9**	**K**	**A**	**A**	**2**

* For backward compatibility to LED based systems, overfilled launch (OFL)

^ 1310 nm CWDM lasers (10GBASE-LX4)

[1] Reach assuming 3.0 dB maximum cabled attenuation at 850 nm and 1.3 dB total connection and splice loss

[2] Supports 220 meter 10GBASE-LRM distance, or 300 meter 10GBASE-LRM distance with 300 meter capable equipment

[3] 3.5/1.5 dB/km maximum attenuation applies for DX-Series cables greater than 36 fibers, and for all DX-Series cables with armor (corrugated steel tape or interlocked armor) or any other secondary outer jacketing

[4] 10 km for 1310 nm 1000BASE-LH, and 5 km for 1310 nm 1000BASE-LX

[5] 10 km for 1310 nm 10GBASE-LR, and 40 km for 1550 nm 10GBASE-ER

[6] Nominal Mode Field Diameter at 1310 nm

Note: many other fiber types, fiber bandwidth, and attenuation performances are available.

Figure-8 Messenger

Applications

- Outdoor aerial installations along utility poles for cable television, telecom or other outside plant campus backbone applications without the need for cable lashing

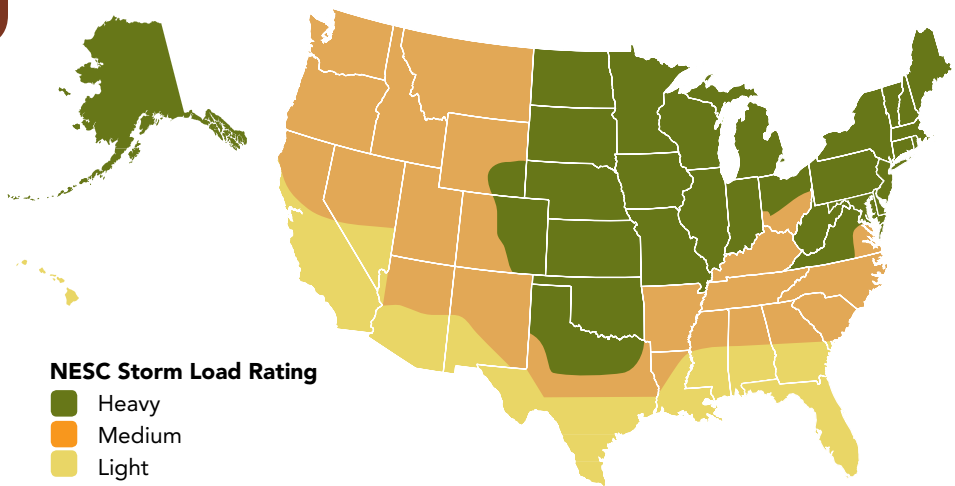
Features

- Figure-eight construction for use with standard messenger clamping and support hardware
- Ideal for new installations. The figure-eight messenger cable reduces installation time and cost by approximately 50% compared to separate installation of a messenger wire and the lashing of the cable to the messenger
- Wide operating temperature range of -40°C to +85°C

** 1/4 inch galvanized messenger standard.*

** Other configurations, including stainless steel and all dielectric messenger, or other jacket materials are available upon request.*

Storm Load Map



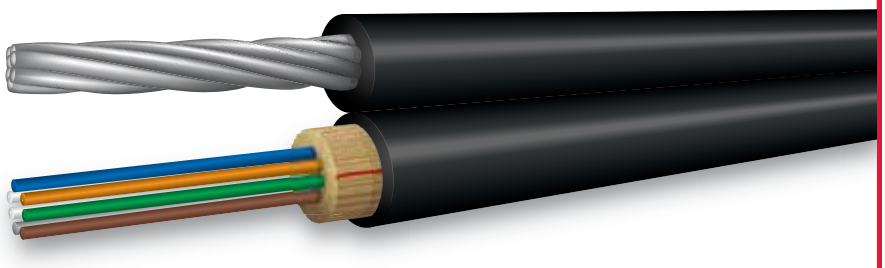
Mechanical and Environmental Performance

Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +85°C
Installation Temperature (cable temp.)	-30°C to +60°C
Impact Resistance:	1,500 Impacts
Crush Resistance:	1,800 N/cm

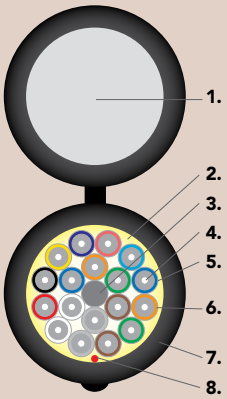
Applicable Standards

Optical Cable Corporation figure-eight tight-buffered fiber optic cables meet the functional requirements of the following stanc

- TIA-568
- TIA-598
- GR-20-CORE
- ICEA-S-87-640



1. Messenger Strength Member
2. Aramid Strength Member
3. Central Filler
4. Optical Filler
5. Acrylate Fiber Coating
6. Color-Coded 900 µm Diameter Hard Elastomeric Tight-Buffer
7. Polyethylene Outer Jacket
8. Ripcord



Cable Characteristics: MX-Series Figure-8 Cable with 1/4 inch steel messenger

Fiber Count	Weight kg/km (lbs/1,000')	NESC Span Length (m) † See storm load map (Heavy/Medium/Light)
2	245 (164)	120/190/285
4	245 (164)	120/190/285
6	249 (167)	120/190/285
8	254 (170)	120/190/285
12	261 (175)	120/190/285
18	264 (177)	120/190/285
24	273 (183)	110/180/260
36	290 (195)	105/170/210
48	307 (206)	95/160/190

† Span lengths based on 1% installation sag.
Other size messengers available.
Contact Optical Cable Corporation for specifications.

Laser Ultra-Fox™ Fiber Performance

Fiber Code	Core/Cladding Diameter (µm)	Wavelength (nm)	Industry Standard Designation	Gigabit Ethernet Distance (m)	10-Gigabit Ethernet Distance (m)	Maximum Cabled Attenuation (dB/km)	Minimum Laser Bandwidth (MHz-km)	Minimum LED Bandwidth* (MHz-km)
WLS	62.5/125 Standard	(850/1310)	OM1 ISO/IEC 11801	300/600	33/300^	3.5/1.5	220/500	200/500
WLX	62.5/125 XL	(850/1310)	OM1 ISO/IEC 11801	500/1000	33/300^	3.0/1.0	385/500	200/500
ALS	50/125 Standard	(850/1310)	OM2 ISO/IEC 11801	600/600	82/300^	3.5/1.5	510/500	500/500
ALX	50/125 XL	(850/1310)	OM2 ISO/IEC 11801	750/600	150/300^[2]	3.0/1.0[3]	950/500	700/500
ALT	50/125 (300 meter 10-GbE)	(850/1310)	OM3 ISO/IEC 11801	1000/600	300/300^[2]	3.0/1.0[3]	2000/500	1500/500
ALE	50/125 (550 meter 10-GbE)	(850/1310)	OM3 ISO/IEC 11801	1040/600	550[1]/300^[2]	3.0/1.0[3]	4700/500	3500/500
SLX	9[6]/125 Low Water Peak Single-mode	(1310/1550)	ITU-T G.652.D	5 km[4]	10 km[5]	0.5/0.5	—	—
SLA	9[6]/125 Bend-Insensitive Single-mode	(1310/1550)	ITU-T G.657.A ITU-T G.652.D	5 km[4]	10 km[5]	0.5/0.5	—	—
SLB	9[6]/125 Bend-Insensitive Single-mode	(1310/1550)	ITU-T G.657.A & B ITU-T G.652.D	5 km[4]	10 km[5]	0.5/0.5	—	—

Ordering Information

	M	**X**				**A**				**9**	**K**	**A**	**G**	**3**
Digit No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14

1 – 2 Messenger Series Ultra-Fox™= **MX**
3 – 5 Fiber count: (See Cable Characteristics Chart) = **002 – 048**
6 Jacket type: Polyethylene = **A**
7 – 9 Fiber type: (See Laser Ultra-Fox™ Fiber Performance Table)
10 250 micron fiber with 900 micron tight buffer = **9**
11 Jacket Color: Black = **K**
12 Rating: None/Outdoor = **A**
13 – 14 Messenger Code: 1/4 Galvanized Steel = **G3**

Example: 12 fiber messenger cable using 62.5 µm standard laser optimized fiber, 1/4 inch messenger, black jacket –

M	**X**	**0**	**1**	**2**	**A**	**W**	**L**	**S**	**9**	**K**	**A**	**G**	**3**

* For backward compatibility to LED based systems, overfilled launch (OFL)

^ 1310 nm CWDM lasers (10GBASE-LX4)

[1] Reach assuming 3.0 dB maximum cabled attenuation at 850 nm and 1.3 dB total connection and splice loss

[2] Supports 220 meter 10GBASE-LRM distance, or 300 meter 10GBASE-LRM distance with 300 meter capable equipment

[3] 3.5/1.5 dB/km maximum attenuation applies for DX-Series cables greater than 36 fibers, and for all DX-Series cables with armor (corrugated steel tape or interlocked armor) or any other secondary outer jacketing

[4] 10 km for 1310 nm 1000BASE-LH, and 5 km for 1310 nm 1000BASE-LX

[5] 10 km for 1310 nm 10GBASE-LR, and 40 km for 1550 nm 10GBASE-ER

[6] Nominal Mode Field Diameter at 1310 nm

Note: many other fiber types, fiber bandwidth, and attenuation performances are available.

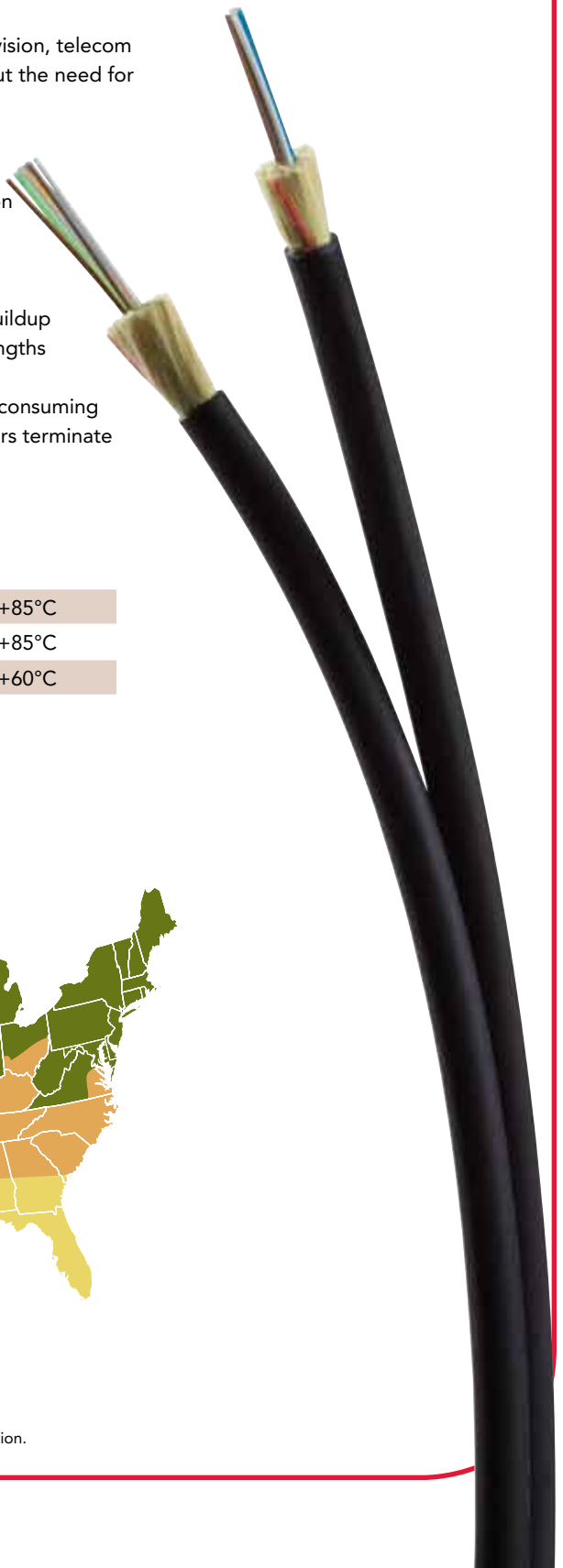
RM-Series Round Messenger

Applications

- Outdoor aerial installations along utility poles for cable television, telecom or other outside plant campus backbone applications without the need for cable lashing or grounding

Features

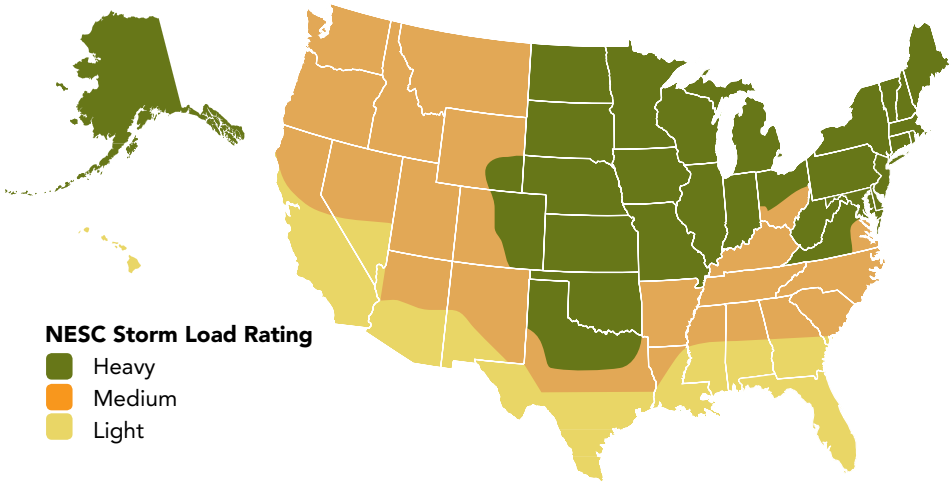
- Lightweight, all-dielectric self-supporting (ADSS) construction is ideal for use near electrical power lines and in areas of frequent lightning
- No messenger or lashing is required
- Round cable construction for minimum wind drag and ice buildup
- Aramid strength members reduce weight for longer span lengths
- Wide operating temperature range of -55°C to +85°C
- 900 µm tight-buffer eliminates the need for costly and time-consuming installation of fanout kits or pigtail splices because connectors terminate directly to the fiber



Environmental Performance

Operating Temperature	-55°C to +85°C
Storage Temperature	-70°C to +85°C
Installation Temperature (cable temp.)	-30°C to +60°C

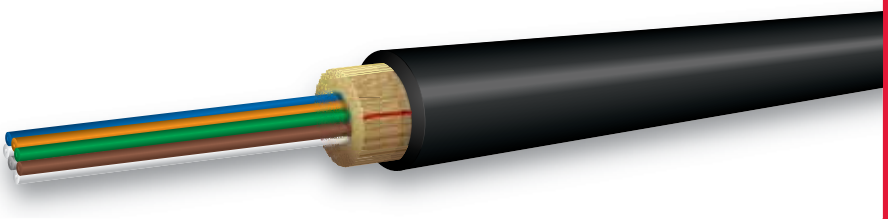
Storm Load Map

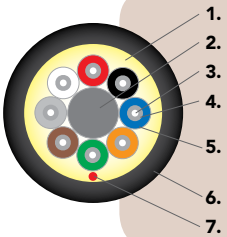


Applicable Standards

Optical Cable Corporation Round Messenger tight-buffered fiber optic cables meet the functional requirements of the following standards

- TIA-568
- TIA-598
- GR-20-CORE
- ICEA S-87-640





1. Aramid Strength Member
2. Central Filler
3. Optical Fiber
4. Acrylate Fiber Coating
5. Color-Coded 900 µm Diameter Hard Elastomeric Tight-Buffer
6. Polyolefin Outer Jacket
7. Ripcord

Cable Characteristics: RM-Series Round Messenger Cables

Fiber Count	Diameter mm (in)	Weight kg/km (lbs/1,000')	Max Rated Cable Tension N (lbs)	Maximum Span Length based on 1% Installation Sag					
				NESC Heavy		NESC Medium		NESC Light	
				meters	feet	meters	feet	meters	feet
2	8.5 (0.33)	52 (35)	12,800 (2,880)	69	225	127	415	230	755
4	8.5 (0.33)	52 (35)	12,800 (2,880)	69	225	127	415	230	755
6	8.7 (0.34)	55 (37)	12,800 (2,880)	69	225	125	410	226	740
8	9.2 (0.36)	64 (43)	12,800 (2,880)	67	220	122	400	215	705
12	9.8 (0.38)	70 (47)	12,800 (2,880)	66	215	119	390	204	670
18	9.6 (0.38)	69 (46)	12,800 (2,880)	66	215	120	395	207	680
24	10.1 (0.40)	79 (53)	12,800 (2,880)	66	215	117	385	198	650
36	10.6 (0.42)	88 (59)	12,800 (2,880)	64	210	116	380	191	625
48	11.6 (0.46)	108 (72)	12,800 (2,880)	61	200	110	360	175	575
60	12.6 (0.50)	115 (77)	12,800 (2,880)	59	195	107	350	163	535
72	13.8 (0.54)	129 (87)	12,800 (2,880)	58	190	102	335	149	490
96	14.7 (0.58)	153 (103)	12,800 (2,880)	56	185	98	320	149	490

* Please contact Optical Cable Corporation with span lengths, storm load rating and sag requirements.

Ultra-Fox™ Plus Fiber Performance*

Fiber Code	Core/Cladding/Coating Diameter (µm)	Wavelength (nm)	Industry Standard Designation	Gigabit Ethernet Distance (m)	10-Gigabit Ethernet Distance (m)	Maximum Cabled Attenuation (dB/km)	Minimum Laser Bandwidth (MHz-km)	Minimum LED Bandwidth (MHz-km)
WST	62.5/125/500	(850/1310)	OM1 ISO/IEC 11801	275/550	33/300	3.5/1.5	—	200/500
AST	50/125/500	(850/1310)	OM2 ISO/IEC 11801	550/550	82/300	3.5/1.5	—	500/500
SLS	9/125/500[1] Single-mode	(1310/1550)	ITU-T G.652.A	5 km[2]	10 km[3]	0.5/0.5	—	—

[1] Typical Mode Field Diameter at 1310 nm = 9 microns

[2] 10 km for 1310 nm 1000BASE-LH, and 5 km for 1310 nm 1000BASE-LR

[3] 10 km for 1310 nm 10GBASE-LR, and 40 km for 1550 nm 10GBASE-ER

Note: Other fiber bandwidth and attenuation performances are available. Laser optimized fiber types available as special order. Contact Optical Cable Corporation for details.

Ordering Information

	R	**M**				**X**				**5**	**K**
Digit No:	1	2	3	4	5	6	7	8	9	10	11

1 – 2 Round Messenger Series Ultra-Fox Plus™
3 – 5 Fiber count: (See Cable Characteristics Chart) = **002 – 096**
6 Jacket type: Polyolefin = **X**
7 – 9 Fiber type: (See Ultra-Fox™ Plus Fiber Performance Table)
62.5 µm Multimode = **WST**
50 µm Multimode = **AST**
Single-mode = **SLS**
10 500 micron fiber with 900 micron tight buffer = **5**
11 Jacket Color – Black = **K**

Example: 12 fiber round messenger cable using 62.5 µm multimode fiber, black jacket –

R	**M**	**0**	**1**	**2**	**X**	**W**	**S**	**T**	**5**	**K**

D-Series Aerial

Applications

- Outdoor aerial distribution cable for duct or aerial lash installations along utility poles for cable television, telecom or other outside plant campus backbone applications

Features

- Tight-buffered construction for easy, direct connector termination or splicing
- Polyethylene outer cable jacket for excellent UV and weather resistance
- High performance tight-buffer on the optical fibers for excellent environmental and mechanical protection
- Wide operating temperature of -40°C to +85°C
- 900 µm buffer eliminates the need for costly and time-consuming installation of fan-out kits or pigtail splices because connectors terminate directly to the fiber
- All-dielectric design does not require grounding or bonding

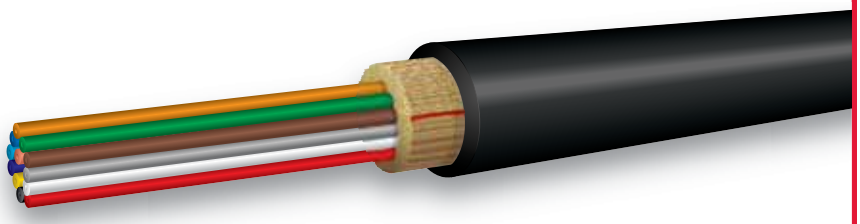
Mechanical and Environmental Performance

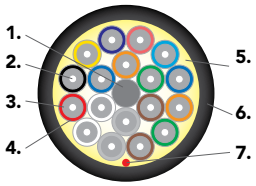
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +85°C
Installation Temperature (cable temp.)	-30°C to +60°C
Impact Resistance:	1,000 Impacts
Crush Resistance:	1,500 N/cm
Flex Resistance:	1,000 Cycles

Applicable Standards

Optical Cable Corporation aerial tight-buffered fiber optic cables meet the functional requirements of the following standards

- ICEA S-87-640
- TIA-568
- TIA-598
- GR-20-CORE





1. Central Filler
2. Optical Fiber
3. Acrylate Fiber Coating
4. Color-Coded 900 µm Diameter Tight-Buffer
5. Aramid Strength Member
6. Outer Jacket
7. Ripcord

Cable Characteristics: Distribution Series Outside Plant Cables

Fiber Count	Diameter mm (in)	Weight kg/km (lbs/1,000')	Installation Tensile Load N (lbs)	Operational Tensile Load N (lbs)	Minimum Bend Radius Installation cm (in)	Minimum Bend Radius Long-Term cm (in)
2	6.3 (0.25)	29 (20)	2,670 (600)	890 (200)	12.6 (5.0)	6.3 (2.5)
4	6.3 (0.25)	29 (20)	2,670 (600)	890 (200)	12.6 (5.0)	6.3 (2.5)
6	6.3 (0.25)	29 (20)	2,670 (600)	890 (200)	12.6 (5.0)	6.3 (2.5)
8	6.5 (0.26)	33 (22)	2,800 (630)	900 (202)	13.0 (5.1)	6.5 (2.6)
12	7.9 (0.31)	47 (32)	2,800 (630)	900 (202)	15.8 (6.2)	7.9 (3.1)
18	7.7 (0.30)	47 (32)	2,800 (630)	900 (202)	15.5 (6.1)	7.7 (3.0)
24	9.4 (0.37)	65 (44)	3,000 (670)	1,000 (220)	18.9 (7.4)	9.4 (3.7)
36	9.7 (0.38)	71 (48)	3,000 (670)	1,000 (220)	19.4 (7.6)	9.7 (3.8)
48	10.7 (0.42)	91 (61)	4,200 (942)	1,400 (313)	21.4 (8.4)	10.7 (4.2)

Installation loads in excess of 2,700 N (600 lbs.) are not recommended.
Ideal for harsh chemical environments including petrochemical.
Other fiber counts available upon request.

Laser Ultra-Fox™ Fiber Performance

Fiber Code	Core/Cladding Diameter (µm)	Wavelength (nm)	Industry Standard Designation	Gigabit Ethernet Distance (m)	10-Gigabit Ethernet Distance (m)	Maximum Cabled Attenuation (dB/km)	Minimum Laser Bandwidth (MHz-km)	Minimum LED Bandwidth* (MHz-km)
WLS	62.5/125 Standard	(850/1310)	OM1 ISO/IEC 11801	300/600	33/300^	3.5/1.5	220/500	200/500
WLX	62.5/125 XL	(850/1310)	OM1 ISO/IEC 11801	500/1000	33/300^	3.0/1.0	385/500	200/500
ALS	50/125 Standard	(850/1310)	OM2 ISO/IEC 11801	600/600	82/300^	3.5/1.5	510/500	500/500
ALX	50/125 XL	(850/1310)	OM2 ISO/IEC 11801	750/600	150/300^[2]	3.0/1.0[3]	950/500	700/500
ALT	50/125 (300 meter 10-GbE)	(850/1310)	OM3 ISO/IEC 11801	1000/600	300/300^[2]	3.0/1.0[3]	2000/500	1500/500
ALE	50/125 (550 meter 10-GbE)	(850/1310)	OM3 ISO/IEC 11801	1040/600	550[1]/300^[2]	3.0/1.0[3]	4700/500	3500/500
SLX	9[6]/125 Low Water Peak Single-mode	(1310/1550)	ITU-T G.652.D	5 km[4]	10 km[5]	0.5/0.5	—	—
SLA	9[6]/125 Bend-Insensitive Single-mode	(1310/1550)	ITU-T G.657.A ITU-T G.652.D	5 km[4]	10 km[5]	0.5/0.5	—	—
SLB	9[6]/125 Bend-Insensitive Single-mode	(1310/1550)	ITU-T G.657.A & B ITU-T G.652.D	5 km[4]	10 km[5]	0.5/0.5	—	—

Ordering Information

	D	**X**				**A**				**9**	**K**	**A**
Digit No:	1	2	3	4	5	6	7	8	9	10	11	12

1 – 2 Aerial Distribution Series Ultra-Fox™= **DX**
3 – 5 Fiber count: (See Cable Characteristics Chart) = **002 – 048**
6 Jacket type: Polyethylene = **A**
7 – 9 Fiber type: (See Laser Ultra-Fox™ Fiber Performance Table)
10 250 micron fiber with 900 micron tight buffer = **9**
11 Jacket Color: Black = **K**
12 Rating: None/Outdoor = **A**

Example: 12 fiber cable using 62.5 µm standard laser optimized fiber, black jacket –

D	**X**	**0**	**1**	**2**	**A**	**W**	**L**	**S**	**9**	**K**	**A**

* For backward compatibility to LED based systems, overfilled launch (OFL)

^ 1310 nm CWDM lasers (10GBASE-LX4)

[1] Reach assuming 3.0 dB maximum cabled attenuation at 850 nm and 1.3 dB total connection and splice loss

[2] Supports 220 meter 10GBASE-LRM distance, or 300 meter 10GBASE-LRM distance with 300 meter capable equipment

[3] 3.5/1.5 dB/km maximum attenuation applies for DX-Series cables greater than 36 fibers, and for all DX-Series cables with armor (corrugated steel tape or interlocked armor) or any other secondary outer jacketing

[4] 10 km for 1310 nm 1000BASE-LH, and 5 km for 1310 nm 1000BASE-LX

[5] 10 km for 1310 nm 10GBASE-LR, and 40 km for 1550 nm 10GBASE-ER

[6] Nominal Mode Field Diameter at 1310 nm

Note: many other fiber types, fiber bandwidth, and attenuation performances are available.

B-Series Mil-Tac

Application

- Ground-tactical cable that is ideal for use in harsh environments where deployment and retrieval for reuse is required

Features

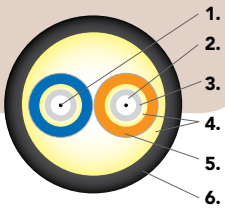
- Extremely strong, lightweight, rugged, survivable tight-buffered cables designed for military tactical field use and commercial applications
- Polyurethane jacketed for abrasion, cut and chemical resistance
- Breakout cable design with individual color-coded subcables protecting each optical fiber
- Crush resistant and resilient, with two separate layers of aramid strength members; in the subcables for individual single-fiber connector and termination pin, and overall for termination to multiway connector backshells or other housings
- Helically stranded cable core for flexibility, deployment survivability and exceptional mechanical protection for the optical fibers
- Cables have been tested and are in use in military data communications applications worldwide
- Can be used outdoors for temporary deployment directly on the ground, in all terrains, including severe environments
- Suitable for industrial, mining and petrochemical environments; chemical resistant
- Round cable design for easy installation and survivability
- Often used with multiway military tactical connectors for maximum connector retention (400 lbs)
- Ideally suited for use with MIL-C-38999 style military connectors; subcables terminate to individual pins and overall aramid strength member terminates to backshell
- 2.0 mm subcables standard
- Tactical Polyurethane (**C**) outer jacket material is standard. Flame retardant (**E**), Flame retardant tactical (**V**) and low smoke zero halogen (**G**) outer jacket materials are available

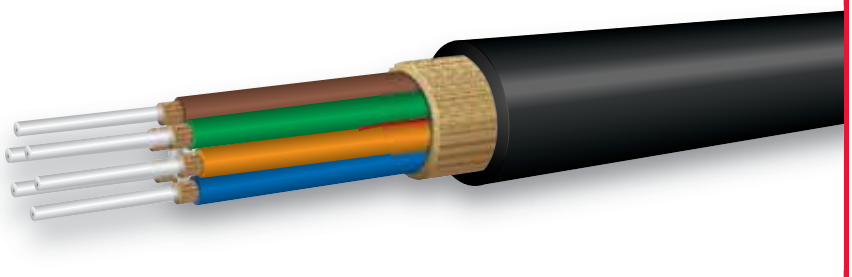
Mechanical and Environmental Performance

(tested to MIL PRF 85045 methods)

Operating Temperature	-55°C to +85°C
Storage Temperature	-70°C to +85°C
Impact Resistance:	200 Impacts (EIA/TIA-455-25 military requirements)
Crush Resistance:	440 N/cm (EIA/TIA-455-41 military requirements)
Flex Resistance:	2,000 Cycles (EIA/TIA-455-104 military requirements)

1. Optical Fiber
2. Acrylate Fiber Coating
3. 900 µm Diameter Hard Elastomeric Tight-Buffer
4. Aramid Strength Member
5. Color-coded Elastomeric Subcable Jacket
6. Core-Locked™ Polyurethane Jacket





Cable Characteristics: Mil-Tac B-Series Breakout Cables

Fiber Count	Diameter mm (in)	Weight kg/km (lbs/1,000')	Installation Tensile Load N (lbs)	Operational Tensile Load N (lbs)	Minimum Bend Radius Installation cm (in)	Minimum Bend Radius Long-Term cm (in)
2	6.5 (0.26)	36 (24)	2,200 (490)	550 (120)	10.4 (4.1)	5.2 (2.0)
4	7.5 (0.30)	47 (32)	2,200 (490)	550 (120)	12.0 (4.7)	6.0 (2.4)
6	8.5 (0.33)	56 (37)	2,400 (540)	600 (130)	13.6 (5.4)	6.8 (2.7)
8	10.0 (0.39)	75 (51)	3,200 (720)	800 (180)	16.0 (6.3)	8.0 (3.1)
10	11.5 (0.45)	100 (67)	4,000 (900)	1,000 (220)	18.4 (7.2)	9.2 (3.6)
12	11.0 (0.43)	88 (59)	4,800 (1,080)	1,200 (270)	17.6 (6.9)	8.8 (3.5)
18	13.5 (0.53)	138 (93)	7,200 (1,620)	1,800 (400)	21.6 (8.5)	10.8 (4.3)
24	14.5 (0.57)	150 (101)	9,600 (2,160)	2,400 (540)	23.2 (9.1)	11.6 (4.6)

"Mil-Tac" designated and tested cables available to 24 fibers.
Other fiber counts available with Polyurethane outer jacket.
Installation loads in excess of 2,700 N (600 lbs) are not recommended.

Ultra-Fox™ Plus Fiber Performance*

Fiber Code	Core/Cladding/Coating Diameter (µm)	Wavelength (nm)	Industry Standard Designation	Gigabit Ethernet Distance (m)	10-Gigabit Ethernet Distance (m)	Maximum Cabled Attenuation (dB/km)	Minimum Laser Bandwidth (MHz-km)	Minimum LED Bandwidth (MHz-km)
WST	62.5/125/500	(850/1310)	OM1 ISO/IEC 11801	275/550	33/300	3.5/1.5	—	200/500
AST	50/125/500	(850/1310)	OM2 ISO/IEC 11801	550/550	82/300	3.5/1.5	—	500/500
SLS	9/125/500[1] Single-mode	(1310/1550)	ITU-T G.652.A	5 km[2]	10 km[3]	0.5/0.5	—	—

[1] Typical Mode Field Diameter at 1310 nm = 9 microns

[2] 10 km for 1310 nm 1000BASE-LH, and 5 km for 1310 nm 1000BASE-LR

[3] 10 km for 1310 nm 10GBASE-LR, and 40 km for 1550 nm 10GBASE-ER

Note: Other fiber bandwidth and attenuation performances are available. Laser optimized fiber types available as special order. Contact Optical Cable Corporation for details.

Ordering Information

	B	**–**								**5**	**K**	**M**
Digit No:	1	2	3	4	5	6	7	8	9	10	11	12

1 – 2 Mil-Tac Breakout Series Ultra-Fox Plus™= **B –**
3 – 5 Fiber count: (See Cable Characteristics Chart) = **002 – 024**
6 Jacket type:
Tactical Polyurethane = **C**
Flame Retardant Polyurethane = **E**
Low Smoke Zero Halogen Polyurethane = **G**
Tactical Flame Retardant Polyurethane = **V**
7 – 9 Fiber type: (See Ultra-Fox™ Plus Fiber Performance Table)
62.5 µm multimode = **WST**
50 µm multimode = **AST**
Single-mode = **SLS**
10 500 micron fiber with 900 micron tight buffer = **5**
11 Jacket Color: Black = **K**
12 Rating: Mil = **M**

Example: 12 fiber mil-tac breakout cable using 62.5 micron fiber, black jacket –

B	**–**	**0**	**1**	**2**	**C**	**W**	**S**	**T**	**5**	**K**	**M**

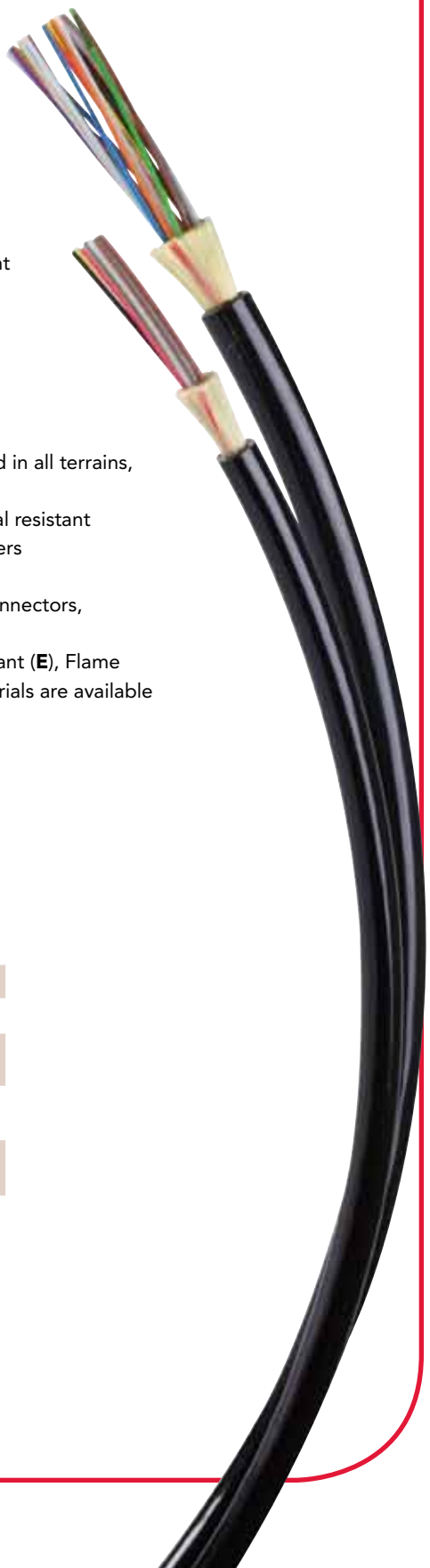
D-Series Mil-Tac

Applications

- Ground-tactical cable that is ideal for use in harsh environments where deployment and retrieval for reuse is required

Features

- Extremely strong, lightweight, rugged, survivable tight-buffered cables designed for military tactical field use and commercial applications
- Compact, round cable design for ease of transportation and deployment
- Designed for use in adverse environments where reduced size and weight are important
- Helically stranded cable core for flexibility, deployment survivability and exceptional mechanical protection for the optical fibers
- Cables have been tested and are in use in military data communications applications worldwide
- Can be used outdoors for temporary deployment directly on the ground in all terrains, including severe environments
- Suitable for industrial, mining and petrochemical environments; chemical resistant
- Crush resistant and resilient with a thick layer of aramid strength members
- Polyurethane jacketed for abrasion, cut and chemical resistance
- Most commonly used with ruggedized multiway military tactical field connectors, for maximum connector retention (400 lbs)
- Tactical Polyurethane (**C**) outer jacket material is standard. Flame retardant (**E**), Flame retardant tactical (**V**) and low smoke zero halogen (**G**) outer jacket materials are available

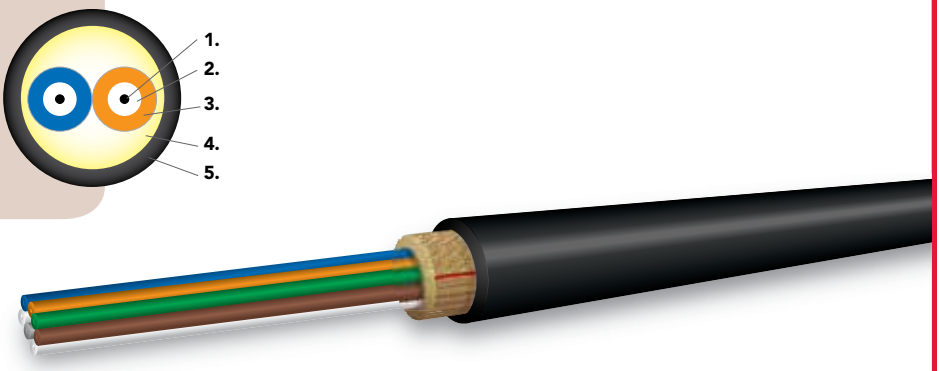


Mechanical and Environmental Performance

(tested to MIL PRF 85045 methods)

Operating Temperature	-55°C to +85°C
Storage Temperature	-70°C to +85°C
Impact Resistance:	200 Impacts (EIA/TIA-455-25 military requirements)
Crush Resistance:	440 N/cm (EIA/TIA-455-41 military requirements)
Flex Resistance:	2,000 Cycles (EIA/TIA-455-104 military requirements)

1. Optical Fiber
2. Acrylate Fiber Coating
3. Color-Coded 900 µm Diameter Hard Elastomeric Tight-Buffer
4. Aramid Strength Member
5. Core-Locked™ Polyurethane Jacket



Cable Characteristics: Mil-Tac D-Series Distribution Cables

Fiber Count	Diameter mm (in)	Weight kg/km (lbs/1,000')	Installation Tensile Load N (lbs)	Operational Tensile Load N (lbs)	Minimum Bend Radius Installation cm (in)	Minimum Bend Radius Long-Term cm (in)
2	5.0 (0.20)	21 (14)	1,800 (400)	600 (130)	8.0 (3.1)	4.0 (1.6)
4	5.5 (0.22)	27 (18)	1,800 (400)	600 (130)	8.9 (3.5)	4.4 (1.7)
6	6.0 (0.24)	32 (22)	1,800 (400)	600 (130)	9.6 (3.8)	4.8 (1.9)
8	6.5 (0.26)	37 (25)	1,800 (400)	600 (130)	10.4 (4.1)	5.2 (2.0)
10	6.5 (0.26)	37 (25)	2,100 (470)	700 (160)	10.4 (4.1)	5.2 (2.0)
12	6.5 (0.26)	36 (24)	2,100 (470)	700 (160)	10.4 (4.1)	5.2 (2.0)
18	7.5 (0.30)	49 (33)	2,400 (540)	800 (180)	12.0 (4.7)	6.0 (2.4)
24	8.5 (0.33)	56 (38)	3,000 (670)	1,000 (220)	13.6 (5.4)	6.8 (2.7)

Ultra-Fox™ Plus Fiber Performance*

Fiber Code	Core/Cladding/Coating Diameter (µm)	Wavelength (nm)	Industry Standard Designation	Gigabit Ethernet Distance (m)	10-Gigabit Ethernet Distance (m)	Maximum Cabled Attenuation (dB/km)	Minimum Laser Bandwidth (MHz-km)	Minimum LED Bandwidth (MHz-km)
WST	62.5/125/500	(850/1310)	OM1 ISO/IEC 11801	275/550	33/300	3.5/1.5	—	200/500
AST	50/125/500	(850/1310)	OM2 ISO/IEC 11801	550/550	82/300	3.5/1.5	—	500/500
SLS	9/125/500[1] Single-mode	(1310/1550)	ITU-T G.652.A	5 km[2]	10 km[3]	0.5/0.5	—	—

[1] Typical Mode Field Diameter at 1310 nm = 9 microns

[2] 10 km for 1310 nm 1000BASE-LH, and 5 km for 1310 nm 1000BASE-LR

[3] 10 km for 1310 nm 10GBASE-LR, and 40 km for 1550 nm 10GBASE-ER

Note: Other fiber bandwidth and attenuation performances are available. Laser optimized fiber types available as special order. Contact Optical Cable Corporation for details.

Ordering Information

	D	**–**								**5**	**K**	**M**
Digit No:	1	2	3	4	5	6	7	8	9	10	11	12

1 – 2 Mil-Tac Distribution Series Ultra-Fox Plus™= **D –**
3 – 5 Fiber count: (See Cable Characteristics Chart) = **002 – 024**
6 Jacket type:
- Tactical Polyurethane = **C**
- Flame Retardant Polyurethane = **E**
- Low Smoke Zero Halogen Polyurethane = **G**
- Tactical Flame Retardant Polyurethane = **V**

7 – 9 Fiber type: (See Laser Ultra-Fox™ Plus Fiber Performance Table)
- 62.5 µm multimode = **WST**
- 50 µm multimode = **AST**
- Single-mode = **SLS**

10 500 micron fiber with 900 micron tight buffer = **5**
11 Jacket Color: Black = **K**
12 Rating: Mil = **M**

Example: 12 fiber mil-tac distribution cable using 62.5 µm fiber, black jacket –

D	**–**	**0**	**1**	**2**	**C**	**W**	**S**	**T**	**5**	**K**	**M**