BELDEN

Fiber Cable for Harsh Environments

CATALOG

Belden's extensive line of robust fiber cable products are designed to withstand the challenges of demanding environments.

Glossary of Terms

CPE	Chlorinated Polyethylene
E-glass	A fiberglass epoxy rod used as a strength member in fiber optic cables
FOTP	Fiber Optic Test Procedure (developed by EIA)
ICEA	Insulated Cable Engineers Association
IEEE1202	Standard for flame-propagation testing of wire and cable. Harmonized with 1685-FT4 and CSA FT4.
LSZH	Low smoke zero halogen, a classification of materials using non-halogen components to achieve flame-retardant properties while reducing the toxicity of combustion byproducts in the interest of human safety.
NFPA®	National Fire Protection Association.
NFPA® 130	Standard for underground, surface and elevated fixed guideway transit and passenger rail systems which provides fire protection and life safety requirements.
NFPA® 502	Standard for limited access highways, road tunnels, bridges, elevated highways, depressed highways, and roadways that are located beneath air-right structures which provides fire protection and fire life safety requirements.
NFPA® 70	The National Electrical Code (NEC) NFPA 70 is the benchmark for safe electrical design, installation, and inspection to protect people and property from electrical hazards.
OFCG	Optical Fiber Conductive General purpose. NEC rating for optical fiber cable resistant to the spread of fire and suitable for general-purpose use, excludes risers and plenums.
OFCR	Optical Fiber Conductive Riser. NEC rating for optical fiber cable used in vertical shafts, or in runs between floors, must have fire-resistant characteristics capable of preventing the spread of fire from floor-to-floor.
OFL	Over Filled Launch
OFNG	Optical Fiber Non-conductive General purpose. NEC rating for optical fiber cable resistant to the spread of fire and suitable for general-purpose use, excludes risers and plenums.
OFNR	Optical Fiber Non-conductive Riser. NEC rating for optical fiber cable used in vertical shafts, or in runs between floors, must have fire-resistant characteristics capable of preventing the spread of fire from floor-to-floor.
OSP	Outside Plant
OTDR	Optical Time Domain Reflectometer
PE	Polyethylene
PVC	Polyvinyl Chloride
RML	Restricted Mode Launch
-ST1	The standard for limited smoke emission under UL 1685. This rating was formerly -LS.
TIA/EIA	Telecommunication Industries Association / Electronic Industries Alliance
UL 1685	Standard for vertical-tray fire-propagation and smoke-release. This test determines the values of cable damage height and smoke release from electrical and optical-fiber cables when the cables are subjected to a flaming ignition source.

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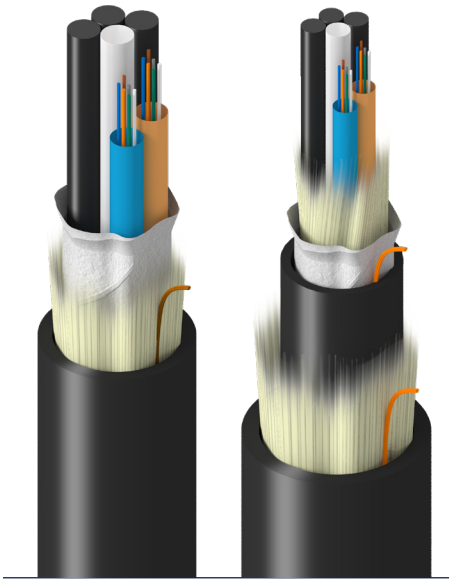
Utility-Grade Fiber Cable for Harsh Environments
Loose Tube Indoor/Outdoor with CPE Jacket



Standards and Ratings

UL1277 Oil Res I & II
TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-50°C to +70°C
Storage	-50°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Buffer Tube	Thermoplastic	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	
Inner Jacket Material/Color	PVC/Black	Optional
Armor	*Optional Interlock and Corrugated Steel Tape Armors are on Following Pages*	
Outer Jacket Material/Color	CPE/Black	

Options

Fiber Counts 12-36 Available in a 6F/Tube Design
Black Jacket (Other Colors Available)

All Dielectric, Single Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TU-*LF-002-RN2N**	0.454 (11.5)	76 (113)
4	4	5	**TU-*LF-004-RN2N**	0.454 (11.5)	76 (113)
6	6	5	**TU-*LF-006-RN2N**	0.454 (11.5)	76 (113)
8	8	5	**TU-*LG-008-RN2N**	0.454 (11.5)	76 (113)
12	12	5	**TU-*LG-012-RN2N**	0.454 (11.5)	76 (113)
24	12	5	**TU-*LG-024-RN2N**	0.454 (11.5)	76 (113)
36	12	5	**TU-*LG-036-RN2N**	0.454 (11.5)	76 (113)
48	12	5	**TU-*LG-048-RN2N**	0.454 (11.5)	76 (113)
60	12	5	**TU-*LG-060-RN2N**	0.454 (11.5)	76 (113)
72	12	6	**TU-*LG-072-RN2N**	0.481 (12.2)	83 (124)
96	12	8	**TU-*LG-096-RN2N**	0.547 (13.9)	107 (159)
144	12	12	**TU-*LG-144-RN2N**	0.701 (17.8)	175 (260)

All Dielectric, Double Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TU-*LF-002-R22N**	0.514 (13.1)	130 (193)
4	4	5	**TU-*LF-004-R22N**	0.514 (13.1)	130 (193)
6	6	5	**TU-*LF-006-R22N**	0.514 (13.1)	130 (193)
8	8	5	**TU-*LG-008-R22N**	0.514 (13.1)	130 (193)
12	12	5	**TU-*LG-012-R22N**	0.514 (13.1)	130 (193)
24	12	5	**TU-*LG-024-R22N**	0.514 (13.1)	130 (193)
36	12	5	**TU-*LG-036-R22N**	0.514 (13.1)	130 (193)
48	12	5	**TU-*LG-048-R22N**	0.514 (13.1)	130 (193)
60	12	5	**TU-*LG-060-R22N**	0.514 (13.1)	130 (193)
72	12	6	**TU-*LG-072-R22N**	0.541 (13.7)	126 (188)
96	12	8	**TU-*LG-096-R22N**	0.532 (13.5)	147 (219)
144	12	12	**TU-*LG-144-R22N**	0.686 (17.4)	231 (344)

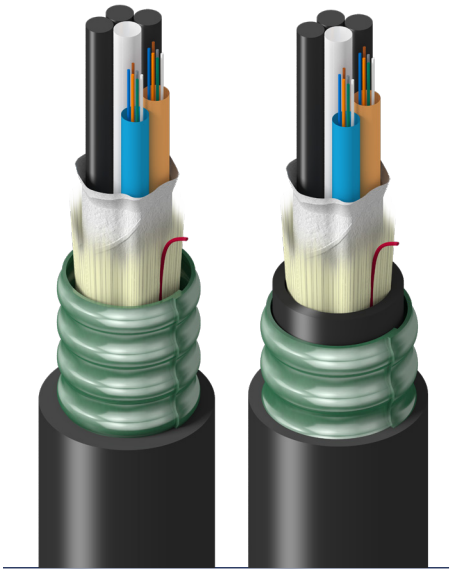
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored
Max. Install Load, lbs (N)	600 (2670)
Max. Long Term Load, lbs (N)	180 (800)
Crush Resistance (FOTP-41), N/cm	220
Impact Resistance (FOTP-25)	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.
Min. Bend Radius During Installation	15X Cable OD
Min. Bend Radius During Operation	10X Cable OD

DataTuff™ Fiber Optic Tray Cables

Utility-Grade Fiber Cable for Harsh Environments
Loose Tube Indoor/Outdoor with CPE Jacket



Standards and Ratings

UL1277 Oil Res I & II
TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Buffer Tube	Thermoplastic	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	
Inner Jacket Material/Color	PVC/Black	Optional
Armor	Corrugated Steel Tape *Optional Interlock Armors are on Following Page*	
Outer Jacket Material/Color	CPE/Black	

Options

Fiber Counts 12-36 Available in a 6F/Tube Design
Black Jacket (Other Colors Available)

Corrugated Steel Tape Armor, Single Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TU-*LF-002-RS2N**	0.530 (13.5)	134 (199)
4	4	5	**TU-*LF-004-RS2N**	0.530 (13.5)	134 (199)
6	6	5	**TU-*LF-006-RS2N**	0.530 (13.5)	134 (199)
8	8	5	**TU-*LG-008-RS2N**	0.530 (13.5)	134 (199)
12	12	5	**TU-*LG-012-RS2N**	0.530 (13.5)	134 (199)
24	12	5	**TU-*LG-024-RS2N**	0.530 (13.5)	134 (199)
36	12	5	**TU-*LG-036-RS2N**	0.530 (13.5)	134 (199)
48	12	5	**TU-*LG-048-RS2N**	0.530 (13.5)	134 (199)
60	12	5	**TU-*LG-060-RS2N**	0.530 (13.5)	134 (199)
72	12	6	**TU-*LG-072-RS2N**	0.570 (14.5)	138 (205)
96	12	8	**TU-*LG-096-RS2N**	0.650 (16.5)	162 (241)
144	12	12	**TU-*LG-144-RS2N**	0.810 (20.6)	263 (391)

Corrugated Steel Tape Armor, Double Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TU-*LF-002-RT2N**	0.630 (16.0)	171 (254)
4	4	5	**TU-*LF-004-RT2N**	0.630 (16.0)	171 (254)
6	6	5	**TU-*LF-006-RT2N**	0.630 (16.0)	171 (254)
8	8	5	**TU-*LG-008-RT2N**	0.630 (16.0)	171 (254)
12	12	5	**TU-*LG-012-RT2N**	0.630 (16.0)	171 (254)
24	12	5	**TU-*LG-024-RT2N**	0.630 (16.0)	171 (254)
36	12	5	**TU-*LG-036-RT2N**	0.630 (16.0)	171 (254)
48	12	5	**TU-*LG-048-RT2N**	0.630 (16.0)	171 (254)
60	12	5	**TU-*LG-060-RT2N**	0.630 (16.0)	171 (254)
72	12	6	**TU-*LG-072-RT2N**	0.660 (16.8)	180 (268)
96	12	8	**TU-*LG-096-RT2N**	0.700 (17.8)	199 (296)
144	12	12	**TU-*LG-144-RT2N**	0.880 (22.4)	295 (439)

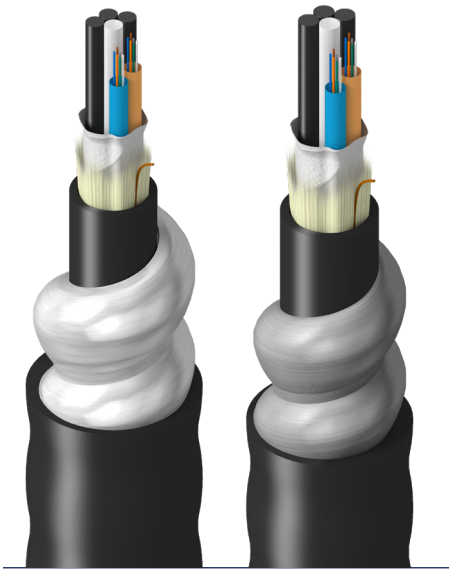
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Corrugated Steel Tape
Max. Install Load, lbs (N)	600 (2670)
Max. Long Term Load, lbs (N)	180 (800)
Crush Resistance (FOTP-41), N/cm	220
Impact Resistance (FOTP-25)	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.
Min. Bend Radius During Installation	20x Cable OD
Min. Bend Radius During Operation	10x Cable OD

DataTuff™ Fiber Optic Tray Cables

Utility-Grade Fiber Cable for Harsh Environments
Loose Tube Indoor/Outdoor with CPE Jacket



Standards and Ratings

UL1277 Oil Res I & II
TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-50°C to +70°C
Storage	-50°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D
Buffer Tube	Thermoplastic
Strength Member	Aramid Yarn
Central Strength Member	E-glass
Inner Jacket Material/Color	PVC/Black
Armor	Aluminum and Steel Interlock *Options for Corrugated Steel Tape and All Dielectric Products are on Previous Pages*
Outer Jacket Material/Color	CPE/Black

Options

Fiber Counts 12-36 Available in a 6F/Tube Design
Black Jacket (Other Colors Available)

Aluminum Interlock Armor, Double Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TU-*LF-002-RI2N**	0.765 (19.4)	232 (345)
4	4	5	**TU-*LF-004-RI2N**	0.765 (19.4)	232 (345)
6	6	5	**TU-*LF-006-RI2N**	0.765 (19.4)	232 (345)
8	8	5	**TU-*LG-008-RI2N**	0.765 (19.4)	232 (345)
12	12	5	**TU-*LG-012-RI2N**	0.765 (19.4)	232 (345)
24	12	5	**TU-*LG-024-RI2N**	0.765 (19.4)	232 (345)
36	12	5	**TU-*LG-036-RI2N**	0.765 (19.4)	232 (345)
48	12	5	**TU-*LG-048-RI2N**	0.765 (19.4)	232 (345)
60	12	5	**TU-*LG-060-RI2N**	0.765 (19.4)	232 (345)
72	12	6	**TU-*LG-072-RI2N**	0.895 (22.7)	278 (414)
96	12	8	**TU-*LG-096-RI2N**	0.960 (24.4)	318 (473)
144	12	12	**TU-*LG-144-RI2N**	1.115 (28.3)	423 (630)

Steel Interlock Armor, Double Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TU-*LF-002-RH2N**	0.765 (19.4)	307 (457)
4	4	5	**TU-*LF-004-RH2N**	0.765 (19.4)	307 (457)
6	6	5	**TU-*LF-006-RH2N**	0.765 (19.4)	307 (457)
8	8	5	**TU-*LG-008-RH2N**	0.765 (19.4)	307 (457)
12	12	5	**TU-*LG-012-RH2N**	0.765 (19.4)	307 (457)
24	12	5	**TU-*LG-024-RH2N**	0.765 (19.4)	307 (457)
36	12	5	**TU-*LG-036-RH2N**	0.765 (19.4)	307 (457)
48	12	5	**TU-*LG-048-RH2N**	0.765 (19.4)	307 (457)
60	12	5	**TU-*LG-060-RH2N**	0.765 (19.4)	307 (457)
72	12	6	**TU-*LG-072-RH2N**	0.895 (22.7)	354 (527)
96	12	8	**TU-*LG-096-RH2N**	0.960 (24.4)	388 (577)
144	12	12	**TU-*LG-144-RH2N**	1.115 (28.3)	511 (760)

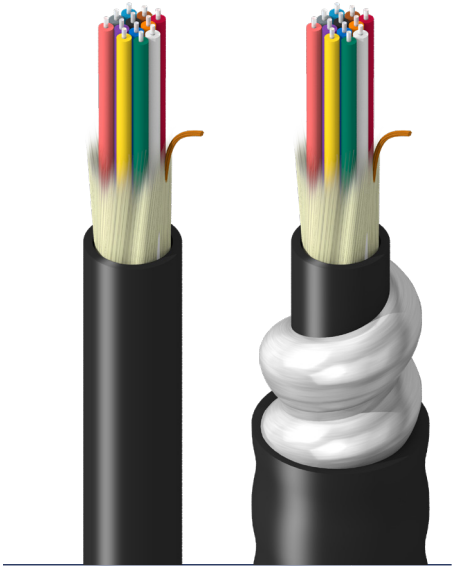
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Interlock Armored
Max. Install Load, lbs (N)	600 (2670)
Max. Long Term Load, lbs (N)	180 (800)
Crush Resistance (FOTP-41), N/cm	440
Impact Resistance (FOTP-25)	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min
Min. Bend Radius During Installation	20x Cable OD
Min. Bend Radius During Operation	10x Cable OD

DataTuff™ Fiber Optic Tray Cables

Utility-Grade Fiber Cable for Harsh Environments
Distribution Indoor/Outdoor with CPE Jacket



Standards and Ratings

UL1277 Oil Res I & II
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Fiber Buffer OD	900um	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	Unitized Only
Inner Jacket Material/Color	PVC/Black	Optional
Armor	Aluminum Interlock	Optional
Outer Jacket Material/Color	CPE/Black	

Options

Black Jacket (Other Colors Available)
Steel Interlock Armor w/ Double Jacket Available (-RH2N)
Corrugated Steel Tape Armor w/ Double Jacket Available (-RT2N)

All Dielectric, Single Jacket

# of Fibers	Fibers / Subunit	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	Single Unit	**TU-*D9-002-RN2N**	0.184 (4.7)	14 (21)
4	Single Unit	**TU-*D9-004-RN2N**	0.200 (5.1)	17 (25)
6	Single Unit	**TU-*D9-006-RN2N**	0.240 (6.1)	23 (34)
8	Single Unit	**TU-*D9-008-RN2N**	0.240 (6.1)	23 (34)
12	Single Unit	**TU-*D9-012-RN2N**	0.270 (6.9)	29 (43)
24	Single Unit	**TU-*D9-024-RN2N**	0.325 (8.3)	42 (63)
36	12	**TU-*DK-036-RN2N**	0.688 (17.5)	168 (250)
48	12	**TU-*DK-048-RN2N**	0.688 (17.5)	157 (233)
72	12	**TU-*DK-072-RN2N**	0.823 (20.9)	229 (340)
96	12	**TU-*DK-096-RN2N**	0.977 (24.8)	344 (512)
144	12	**TU-*DK-144-RN2N**	1.100 (27.9)	377 (561)

Aluminum Interlock Armor, Double Jacket

# of Fibers	Fibers / Subunit	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	Single Unit	**TU-*D9-002-RI2N**	0.505 (12.8)	104 (155)
4	Single Unit	**TU-*D9-004-RI2N**	0.520 (13.2)	112 (167)
6	Single Unit	**TU-*D9-006-RI2N**	0.545 (13.8)	127 (189)
8	Single Unit	**TU-*D9-008-RI2N**	0.545 (13.8)	127 (189)
12	Single Unit	**TU-*D9-012-RI2N**	0.570 (14.5)	135 (201)
24	Single Unit	**TU-*D9-024-RI2N**	0.635 (16.1)	165 (246)
36	12	**TU-*DK-036-RI2N**	1.086 (27.6)	380 (566)
48	12	**TU-*DK-048-RI2N**	1.086 (27.6)	380 (566)
72	12	**TU-*DK-072-RI2N**	1.221 (31.0)	485 (722)
96	12	**TU-*DK-096-RI2N**	1.390 (35.3)	639 (951)
144	12	**TU-*DK-144-RI2N**	1.510 (38.4)	701 (1043)

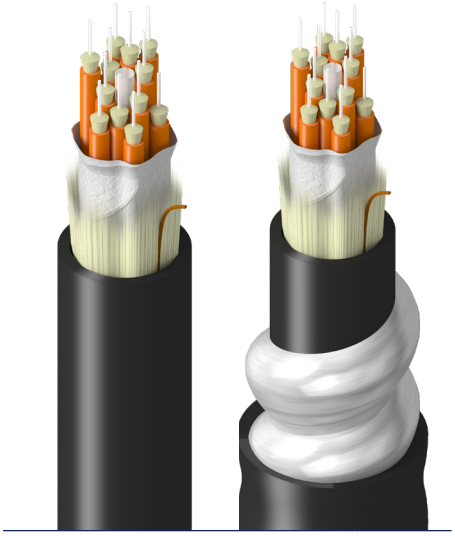
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)	Subunit Color
OS2 - Single Mode	S	1310/1550	0.5/0.5	-	-	5000/-	10,000/40,000	Yellow
OM1 - 62.5/125µm Multi-Mode	1	850/1300	3.5/1.25	200/500	220/-	300/550	33/-	Orange
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-	Aqua
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-	Erika Violet

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Interlock Armored
Max. Install Load, lbs (N)	<=12f - 300 (1330) >12f - 600 (2670)	
Max. Long Term Load, lbs (N)	<=12f - 90 (400) >12f - 180 (800)	
Crush Resistance (FOTP-41), N/cm	220	440
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

DataTuff™ Fiber Optic Tray Cables

Utility-Grade Fiber Cable for Harsh Environments
Breakout Indoor/Outdoor with CPE Jacket



Standards and Ratings

UL1277 Oil Res I & II
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NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Fiber Buffer OD	900um	
Subunit OD	2.0mm	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	>6f Only
Inner Jacket Material/Color	PVC/Black	Optional
Armor	Aluminum Interlock	Optional
Outer Jacket Material/Color	CPE/Black	

Options

Black Jacket (Other Colors Available)
Steel Interlock Armor w/ Double Jacket Available (-RH2N)
Corrugated Steel Tape Armor w/ Double Jacket Available (-RT2N)

All Dielectric, Single Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD	Cable Bulk Weight
		in (mm)	lbs/kft (kg/km)
2	**TU-xBB-002-RN2N**	0.260 (6.6)	23 (34)
4	**TU-xBB-004-RN2N**	0.321 (8.2)	29 (43)
6	**TU-xBB-006-RN2N**	0.373 (9.5)	35 (52)
8	**TU-xBB-008-RN2N**	0.435 (11.0)	87 (129)
12	**TU-xBB-012-RN2N**	0.540 (13.7)	109 (162)
18	**TU-xBB-018-RN2N**	0.540 (13.7)	109 (162)

Aluminum Interlock Armor, Double Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD	Cable Bulk Weight
		in (mm)	lbs/kft (kg/km)
2	**TU-xBB-002-RI2N**	0.570 (14.5)	130 (193)
4	**TU-xBB-004-RI2N**	0.635 (16.1)	152 (226)
6	**TU-xBB-006-RI2N**	0.685 (17.4)	170 (253)
8	**TU-xBB-008-RI2N**	0.745 (18.9)	160 (238)
12	**TU-xBB-012-RI2N**	0.950 (24.1)	242 (360)
18	**TU-xBB-018-RI2N**	0.950 (24.1)	242 (360)

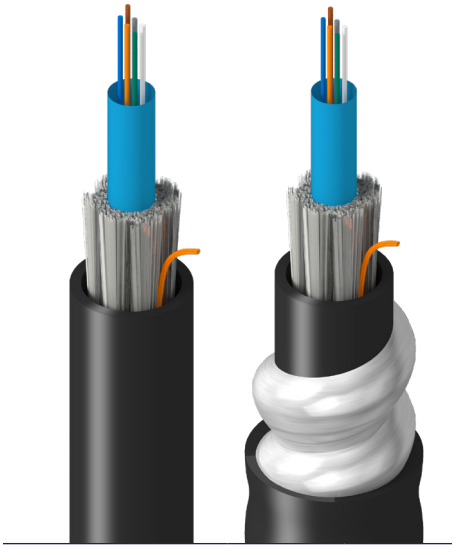
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)	Subunit Color
OS2 - Single Mode	S	1310/1550	0.5/0.5	-	-	5000/-	10,000/40,000	Yellow
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.5/1.25	200/500	220/-	300/550	33/-	Orange
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-	Aqua
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-	Erika Violet

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Interlock Armored
Max. Install Load, lbs (N)	<=12f - 300 (1330) >12f - 600 (2670)	
Max. Long Term Load, lbs (N)	<=12f - 90 (400) >12f - 180 (800)	
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

DataTuff™ Fiber Optic Tray Cables

Utility-Grade Fiber Cable for Harsh Environments
Central Loose Tube Indoor/Outdoor with CPE Jacket



Standards and Ratings

UL1277 Oil Res I & II
TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006
Rodent Resistant

Temperature

Operating	-50°C to +70°C	Corrugated Steel Tape is -40°C
Storage	-50°C to +70°C	Corrugated Steel Tape is -40°C
Installation	-10°C to +60°C	

Materials

Fiber Colors	Per TIA/EIA 598-D	
Buffer Tube	Thermoplastic	
Strength Member	Fiber Glass	
Inner Jacket Material/Color	PVC/Black	Optional
Armor	Aluminum Interlock, or Corrugated Steel Tape	Optional
Outer Jacket Material/Color	CPE/Black	

Options

Black Jacket (Other Colors Available)
Steel Interlock Armor w/ Double Jacket Available (-RH2N)
Corrugated Steel Tape Armor w/ Double Jacket Available (-RT2N)

All Dielectric, Single Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	**TU-*C0-002-RR2N**	0.315 (8.0)	42 (63)
4	**TU-*C0-004-RR2N**	0.315 (8.0)	42 (63)
6	**TU-*C0-006-RR2N**	0.315 (8.0)	42 (63)
8	**TU-*C0-008-RR2N**	0.315 (8.0)	42 (63)
12	**TU-*C0-012-RR2N**	0.315 (8.0)	42 (63)
24	**TU-*C0-024-RR2N**	0.315 (8.0)	42 (63)

All Dielectric, Double Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	**TU-*C0-002-RX2N**	0.500 (12.7)	103 (153)
4	**TU-*C0-004-RX2N**	0.500 (12.7)	103 (153)
6	**TU-*C0-006-RX2N**	0.500 (12.7)	103 (153)
8	**TU-*C0-008-RX2N**	0.500 (12.7)	103 (153)
12	**TU-*C0-012-RX2N**	0.500 (12.7)	103 (153)
24	**TU-*C0-024-RX2N**	0.500 (12.7)	103 (153)

Corrugated Steel Tape Armor, Single Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	**TU-*C0-002-RS2N**	0.410 (10.4)	83 (124)
4	**TU-*C0-004-RS2N**	0.410 (10.4)	83 (124)
6	**TU-*C0-006-RS2N**	0.410 (10.4)	83 (124)
8	**TU-*C0-008-RS2N**	0.410 (10.4)	83 (124)
12	**TU-*C0-012-RS2N**	0.410 (10.4)	83 (124)
24	**TU-*C0-024-RS2N**	0.410 (10.4)	83 (124)

Aluminum Interlock Armor, Double Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	**TU-*C0-002-RI2N**	0.615 (15.6)	152 (226)
4	**TU-*C0-004-RI2N**	0.615 (15.6)	152 (226)
6	**TU-*C0-006-RI2N**	0.615 (15.6)	152 (226)
8	**TU-*C0-008-RI2N**	0.615 (15.6)	152 (226)
12	**TU-*C0-012-RI2N**	0.615 (15.6)	152 (226)
24	**TU-*C0-024-RI2N**	0.615 (15.6)	152 (226)

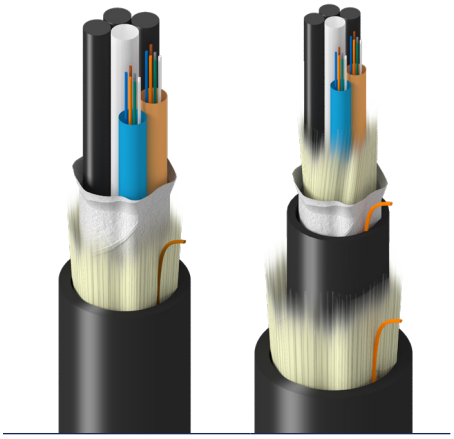
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-

*OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-armored	Interlock Armored	Corrugated Steel Tape
Max. Install Load, lbs (N)	300 (1330)		
Max. Long Term Load, lbs (N)	90 (400)		
Crush Resistance (FOTP-41), N/cm	220	440	220
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.		
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD	10x Cable OD

DataTuff™ Fiber Optic Factory Cables

Factory-Grade Fiber Cable for Harsh Factory Environments
Loose Tube Indoor/Outdoor with PVC Jacket



Standards and Ratings

Oil and Hydraulic Fluid Resistant
Fluorescent Light UV Resistant
Ozone Resistant, ASTM D470
TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Resistant to Fluids

Water Resistant
Cutting Fluids
Lubricating Oils
Hydaulic Fluids
Vegetation Killer
Dissinfectants - Quaternary Ammonium

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber counts 12-36 are also available in a 6F/Tube Design	Per TIA/EIA 598-D
Black Jacket (Other Colors Available)	Thermoplastic
Steel Interlocked Armor w/ Double Jacket Available (-RH2N)	Aramid Yarn
Central Strength Member	E-glass
Inner Jacket Material/Color	PVC/Black
Armor	*Optional Interlock and Corrugated Tape Armors are on Following Pages*
Outer Jacket Material/Color	PVC/Black

Options

Fiber counts 12-36 are also available in a 6F/Tube Design
Black Jacket (Other Colors Available)

All Dielectric, Single Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TF-*LF-002-RN5N**	0.454 (11.5)	87 (129)
4	4	5	**TF-*LF-004-RN5N**	0.454 (11.5)	87 (129)
6	6	5	**TF-*LF-006-RN5N**	0.454 (11.5)	87 (129)
8	8	5	**TF-*LG-008-RN5N**	0.454 (11.5)	87 (129)
12	12	5	**TF-*LG-012-RN5N**	0.454 (11.5)	87 (129)
24	12	5	**TF-*LG-024-RN5N**	0.454 (11.5)	87 (129)
36	12	5	**TF-*LG-036-RN5N**	0.454 (11.5)	87 (129)
48	12	5	**TF-*LG-048-RN5N**	0.454 (11.5)	87 (129)
60	12	5	**TF-*LG-060-RN5N**	0.454 (11.5)	87 (129)
72	12	6	**TF-*LG-072-RN5N**	0.481 (12.2)	91 (135)
96	12	8	**TF-*LG-096-RN5N**	0.547 (13.9)	116 (173)
144	12	12	**TF-*LG-144-RN5N**	0.701 (17.8)	195 (290)

All Dielectric, Double Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TF-*LF-002-R25N**	0.514 (13.1)	104 (155)
4	4	5	**TF-*LF-004-R25N**	0.514 (13.1)	104 (155)
6	6	5	**TF-*LF-006-R25N**	0.514 (13.1)	104 (155)
8	8	5	**TF-*LG-008-R25N**	0.514 (13.1)	104 (155)
12	12	5	**TF-*LG-012-R25N**	0.514 (13.1)	104 (155)
24	12	5	**TF-*LG-024-R25N**	0.514 (13.1)	104 (155)
36	12	5	**TF-*LG-036-R25N**	0.514 (13.1)	104 (155)
48	12	5	**TF-*LG-048-R25N**	0.514 (13.1)	104 (155)
60	12	5	**TF-*LG-060-R25N**	0.514 (13.1)	104 (155)
72	12	6	**TF-*LG-072-R25N**	0.541 (13.7)	127 (189)
96	12	8	**TF-*LG-096-R25N**	0.532 (13.5)	148 (220)
144	12	12	**TF-*LG-144-R25N**	0.686 (17.4)	231 (344)

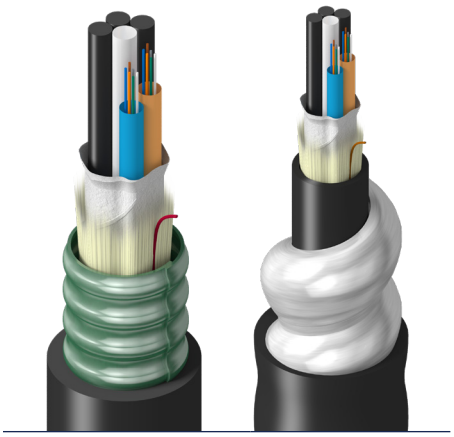
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored
Max. Install Load, lbs (N)	600 (2670)
Max. Long Term Load, lbs (N)	180 (800)
Crush Resistance (FOTP-41), N/cm	220
Impact Resistance (FOTP-25)	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.
Min. Bend Radius During Installation	15X Cable OD
Min. Bend Radius During Operation	10X Cable OD

DataTuff™ Fiber Optic Factory Cables

Factory-Grade Fiber Cable for Harsh Factory Environments
Loose Tube Indoor/Outdoor with PVC Jacket



Standards and Ratings

Oil and Hydraulic Fluid Resistant
Fluorescent Light UV Resistant
Ozone Resistant, ASTM D470
TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Resistant to Fluids

Water Resistant
Cutting Fluids
Lubricating Oils
Hydaulic Fluids
Vegetation Killer
Dissinfectants - Quaternary Ammonium

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber counts 12-36 are also available in a 6F/Tube Design	Per TIA/EIA 598-D
Black Jacket (Other Colors Available)	Thermoplastic
Steel Interlocked Armor w/ Double Jacket Available (-RH2N)	Aramid Yarn
Central Strength Member	E-glass
Inner Jacket Material/Color	PVC/Black
Armor	Aluminum Interlock or Corrugated Steel Tape
Outer Jacket Material/Color	PVC/Black

Options

Fiber counts 12-36 are also available in a 6F/Tube Design
Black Jacket (Other Colors Available)
Steel Interlock Armor w/ Double Jacket Available (-RH2N)

Corrugated Steel Tape Armor, Single Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TF-*LF-002-RS5N**	0.530 (13.5)	115 (171)
4	4	5	**TF-*LF-004-RS5N**	0.530 (13.5)	115 (171)
6	6	5	**TF-*LF-006-RS5N**	0.530 (13.5)	115 (171)
8	8	5	**TF-*LG-008-RS5N**	0.530 (13.5)	115 (171)
12	12	5	**TF-*LG-012-RS5N**	0.530 (13.5)	115 (171)
24	12	5	**TF-*LG-024-RS5N**	0.530 (13.5)	115 (171)
36	12	5	**TF-*LG-036-RS5N**	0.530 (13.5)	115 (171)
48	12	5	**TF-*LG-048-RS5N**	0.530 (13.5)	115 (171)
60	12	5	**TF-*LG-060-RS5N**	0.530 (13.5)	115 (171)
72	12	6	**TF-*LG-072-RS5N**	0.570 (14.5)	138 (205)
96	12	8	**TF-*LG-096-RS5N**	0.650 (16.5)	162 (241)
144	12	12	**TF-*LG-144-RS5N**	0.810 (20.6)	263 (391)

Aluminum Interlock Armor, Double Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TF-*LF-002-RI5N**	.765 (19.4)	242 (360)
4	4	5	**TF-*LF-004-RI5N**	.765 (19.4)	242 (360)
6	6	5	**TF-*LF-006-RI5N**	.765 (19.4)	242 (360)
8	8	5	**TF-*LG-008-RI5N**	.765 (19.4)	242 (360)
12	12	5	**TF-*LG-012-RI5N**	.765 (19.4)	242 (360)
24	12	5	**TF-*LG-024-RI5N**	.765 (19.4)	242 (360)
36	12	5	**TF-*LG-036-RI5N**	.765 (19.4)	242 (360)
48	12	5	**TF-*LG-048-RI5N**	.765 (19.4)	242 (360)
60	12	5	**TF-*LG-060-RI5N**	.765 (19.4)	242 (360)
72	12	6	**TF-*LG-072-RI5N**	.895 (22.7)	278 (414)
96	12	8	**TF-*LG-096-RI5N**	.960 (24.4)	318 (473)
144	12	12	**TF-*LG-144-RI5N**	1.115 (28.3)	401 (597)

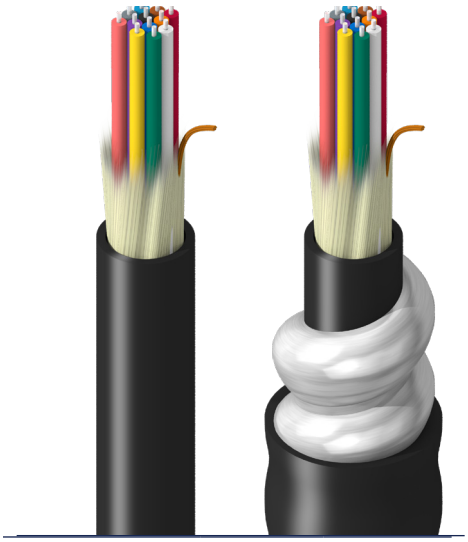
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Interlock Armored	Corrugated Steel Tape
Max. Install Load, lbs (N)	600 (2670)		
Max. Long Term Load, lbs (N)	180 (800)		
Crush Resistance (FOTP-41), N/cm	220	440	220
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.		
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD	10x Cable OD

DataTuff™ Fiber Optic Factory Cables

Factory-Grade Fiber Cable for Harsh Factory Environments
Distribution Indoor/Outdoor with PVC Jacket



Standards and Ratings

Oil and Hydraulic Fluid Resistant
Fluorescent Light UV Resistant
Ozone Resistant, ASTM D470
TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Resistant to Fluids

Water Resistant
Cutting Fluids
Lubricating Oils
Hydaulic Fluids
Vegetation Killer
Dissinfectants - Quaternary Ammonium

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Fiber Buffer OD	900um	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	Unitized Only
Inner Jacket Material/Color	PVC/Black	Optional
Armor	Aluminum Interlock	Optional
Outer Jacket Material/Color	PVC/Black	

Options

Black Jacket (Other Colors Available)
Steel Interlock Armor w/ Double Jacket Available (-RH2N)

All Dielectric, Single Jacket

# of Fibers	Fibers / Subunit	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	Single Unit	**TF-*D9-002-RN5N**	0.184 (4.7)	14 (21)
4	Single Unit	**TF-*D9-004-RN5N**	0.200 (5.1)	17 (25)
6	Single Unit	**TF-*D9-006-RN5N**	0.220 (5.6)	20 (30)
8	Single Unit	**TF-*D9-008-RN5N**	0.235 (6.0)	22 (33)
12	Single Unit	**TF-*D9-012-RN5N**	0.260 (6.6)	27 (40)
24	Single Unit	**TF-*D9-024-RN5N**	0.325 (8.3)	42 (63)
36	12	**TF-*DK-036-RN5N**	0.688 (17.5)	157 (234)
48	12	**TF-*DK-048-RN5N**	0.688 (17.5)	157 (234)
72	12	**TF-*DK-072-RN5N**	0.823 (20.9)	229 (341)
96	12	**TF-*DK-096-RN5N**	0.977 (24.8)	344 (512)
144	12	**TF-*DK-144-RN5N**	1.100 (27.9)	377 (561)

Aluminum Interlock Armor, Double Jacket

# of Fibers	Fibers / Subunit	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	Single Unit	**TF-*D9-002-RI5N**	0.505 (12.8)	104 (155)
4	Single Unit	**TF-*D9-004-RI5N**	0.520 (13.2)	112 (167)
6	Single Unit	**TF-*D9-006-RI5N**	0.540 (13.7)	119 (177)
8	Single Unit	**TF-*D9-008-RI5N**	0.545 (13.8)	127 (189)
12	Single Unit	**TF-*D9-012-RI5N**	0.570 (14.5)	135 (201)
24	Single Unit	**TF-*D9-024-RI5N**	0.635 (16.1)	165 (246)
36	12	**TF-*DK-036-RI5N**	1.086 (27.6)	380 (566)
48	12	**TF-*DK-048-RI5N**	1.086 (27.6)	380 (566)
72	12	**TF-*DK-072-RI5N**	1.221 (31.0)	485 (722)
96	12	**TF-*DK-096-RI5N**	1.390 (35.3)	639 (951)
144	12	**TF-*DK-144-RI5N**	1.510 (38.4)	701 (1043)

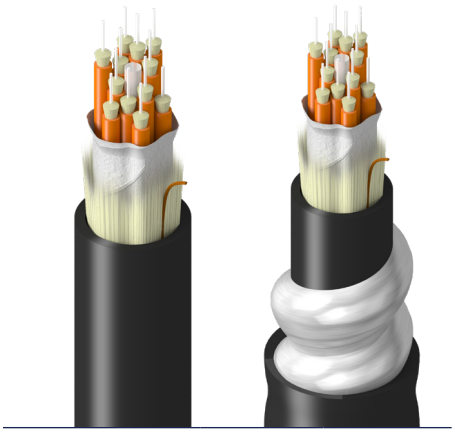
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)	Subunit Color
OS2 - Single Mode	S	1310/1550	0.5/0.5	-	-	5000/-	10,000/40,000	Yellow
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.5/1.25	200/500	220/-	300/550	33/-	Orange
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-	Aqua
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-	Erika Violet

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Interlock Armored
Max. Install Load, lbs (N)	<=12f - 300 (1330) >12f - 600 (2670)	
Max. Long Term Load, lbs (N)	<=12f - 90 (400) >12f - 180 (800)	
Crush Resistance (FOTP-41), N/cm	220	440
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

DataTuff™ Fiber Optic Factory Cables

Factory-Grade Fiber Cable for Harsh Factory Environments
Breakout Indoor/Outdoor with PVC Jacket



Standards and Ratings

Oil and Hydraulic Fluid Resistant
Fluorescent Light UV Resistant
Ozone Resistant, ASTM D470
TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Resistant to Fluids

Water Resistant
Cutting Fluids
Lubricating Oils
Hydaulic Fluids
Vegetation Killer
Dissinfectants - Quaternary Ammonium

Temperature

Operating	-40°C to +70°C	
Storage	-40°C to +70°C	
Installation	-10°C to +60°C	

Materials

Fiber Colors	Per TIA/EIA 598-D	
Fiber Buffer OD	900um	
Subunit OD	2.0mm	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	>6f only
Inner Jacket Material/Color	PVC/Black	
Armor	Aluminum Interlock	Optional
Outer Jacket Material/Color	PVC/Black	

Options

Black Jacket (Other Colors Available)
Steel Interlock Armor w/ Double Jacket Available (-RH2N)

All Dielectric, Single Jacket			
# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD	Cable Bulk Weight
		in (mm)	lbs/kft (kg/km)
2	**TF-xBB-002-RN5N**	0.260 (6.6)	23 (34)
4	**TF-xBB-004-RN5N**	0.321 (8.2)	29 (43)
6	**TF-xBB-006-RN5N**	0.373 (9.5)	64 (95)
8	**TF-xBB-008-RN5N**	0.435 (11.0)	87 (129)
12	**TF-xBB-012-RN5N**	0.540 (13.7)	109 (162)
18	**TF-xBB-018-RN5N**	0.540 (13.7)	109 (162)

Aluminum Interlock Armor, Double Jacket			
# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD	Cable Bulk Weight
		in (mm)	lbs/kft (kg/km)
2	**TF-xBB-002-RI5N**	0.570 (14.5)	130 (193)
4	**TF-xBB-004-RI5N**	0.635 (16.1)	152 (226)
6	**TF-xBB-006-RI5N**	0.685 (17.4)	170 (253)
8	**TF-xBB-008-RI5N**	0.745 (18.9)	160 (238)
12	**TF-xBB-012-RI5N**	0.950 (24.1)	242 (360)
18	**TF-xBB-018-RI5N**	0.950 (24.1)	242 (360)

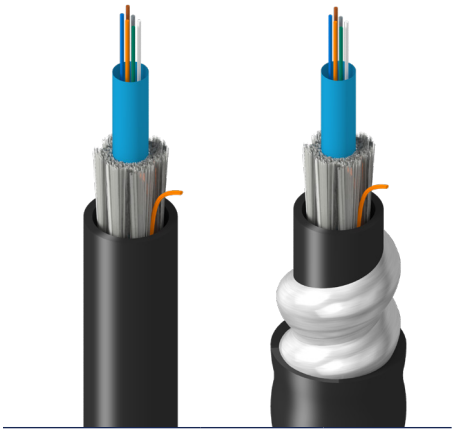
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)	Subunit Color
OS2 - Single Mode	S	1310/1550	0.5/0.5	-	-	5000/-	10,000/40,000	Yellow
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.5/1.25	200/500	220/-	300/550	33/-	Orange
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-	Aqua
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-	Erika Violet

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Interlock Armored
Max. Install Load, lbs (N)	<=12f - 300 (1330) >12f - 600 (2670)	
Max. Long Term Load, lbs (N)	<=12f - 90 (400) >12f - 180 (800)	
Crush Resistance (FOTP-41), N/cm	220	440
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

DataTuff™ Fiber Optic Factory Cables

Factory-Grade Fiber Cable for Harsh Factory Environments
Central Loose Tube Indoor/Outdoor with PVC Jacket



Standards and Ratings

Oil and Hydraulic Fluid Resistant
Fluorescent Light UV Resistant
Ozone Resistant, ASTM D470
Rodent Resistant
TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Resistant to Fluids

Water Resistant
Cutting Fluids
Lubricating Oils
Hydaulic Fluids
Vegetation Killer
Dissinfectants - Quaternary Ammonium

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Buffer Tube	Thermoplastic	
Strength Member	Fiber Glass	
Inner Jacket Material/Color	PVC/Black	Optional
Armor	Aluminum Interlock or Corrugated Steel Tape	Optional
Outer Jacket Material/Color	PVC/Black	

Options

Black Jacket (Other Colors Available)
Steel Interlock Armor w/ Double Jacket Available (-RH2N)

All Dielectric, Single Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	**TF-*C0-002-RR5N**	0.315 (8.0)	42 (63)
4	**TF-*C0-004-RR5N**	0.315 (8.0)	42 (63)
6	**TF-*C0-006-RN5N**	0.315 (8.0)	42 (63)
8	**TF-*C0-008-RR5N**	0.315 (8.0)	42 (63)
12	**TF-*C0-012-RN5N**	0.315 (8.0)	42 (63)
24	**TF-*C0-024-RN5N**	0.315 (8.0)	42 (63)

All Dielectric, Double Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	**TF-*C0-002-RX5N**	0.500 (12.7)	103 (153)
4	**TF-*C0-004-RX5N**	0.500 (12.7)	103 (153)
6	**TF-*C0-006-RX5N**	0.500 (12.7)	103 (153)
8	**TF-*C0-008-RX5N**	0.500 (12.7)	103 (153)
12	**TF-*C0-012-RX5N**	0.500 (12.7)	103 (153)
24	**TF-*C0-024-RX5N**	0.500 (12.7)	103 (153)

Corrugated Steel Tape Armor, Single Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	**TF-*C0-002-RS5N**	0.410 (10.4)	83 (124)
4	**TF-*C0-004-RS5N**	0.410 (10.4)	83 (124)
6	**TF-*C0-006-RS5N**	0.410 (10.4)	83 (124)
8	**TF-*C0-008-RS5N**	0.410 (10.4)	83 (124)
12	**TF-*C0-012-RS5N**	0.410 (10.4)	83 (124)
24	**TF-*C0-024-RS5N**	0.410 (10.4)	83 (124)

Aluminum Interlock Armor, Double Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	**TF-*C0-002-RI5N**	0.615 (15.6)	152 (226)
4	**TF-*C0-004-RI5N**	0.615 (15.6)	152 (226)
6	**TF-*C0-006-RI5N**	0.615 (15.6)	152 (226)
8	**TF-*C0-008-RI5N**	0.615 (15.6)	152 (226)
12	**TF-*C0-012-RI5N**	0.615 (15.6)	152 (226)
24	**TF-*C0-024-RI5N**	0.615 (15.6)	152 (226)

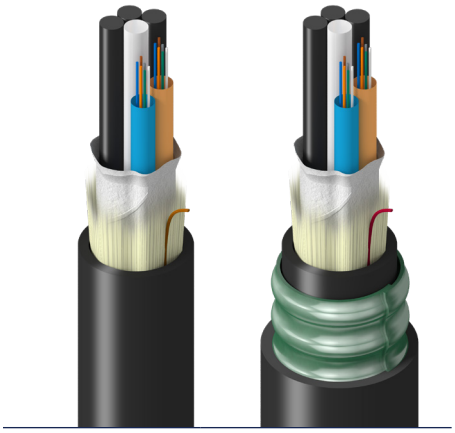
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-armored	Interlock Armored	Corrugated Steel Tape
Max. Install Load, lbs (N)	300 (1330)		
Max. Long Term Load, lbs (N)	90 (400)		
Crush Resistance (FOTP-41), N/cm	220	440	220
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.		
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD	10x Cable OD

RailTuff® Industrial Fiber Cables

Transit-Grade Fiber Cable for Harsh Factory Environments
Loose Tube Indoor/Outdoor
Low Smoke Zero Halogen (LSZH), NFPA 130 and 502 Compliant



Standards and Ratings

TIA/EIA-568.3-D
NEC/CEC OFNG-ST1 / OFCG-ST1 FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C Arctic -50°C to +70°C
Storage	-40°C to +70°C Arctic -50°C to +70°C
Installation	-10°C to +60°C Arctic -30°C to +50°C

Materials

Fiber Colors	Per TIA/EIA 598-D
Buffer Tube (w/gel) (Artic is Dry)	Thermoplastic
Strength Member	Aramid Yarn
Central Strength Member	E-glass
Inner Jacket Material/Color	LSZH/Black
Armor (not available on Arctic grade)	Aluminum Interlock or Corrugated Steel Tape
Outer Jacket Material/Color	LSZH/Black

Options

Fiber counts 12-36 are also available in a 6F/Tube Design
Black Jacket (Other Colors Available)
Steel Interlock Armor Available

All Dielectric, Single Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TT-*LF-002-HNNN**	0.454 (11.5)	87 (129)
4	4	5	**TT-*LF-004-HNNN**	0.454 (11.5)	87 (129)
6	6	5	**TT-*LF-006-HNNN**	0.454 (11.5)	87 (129)
8	8	5	**TT-*LG-008-HNNN**	0.454 (11.5)	87 (129)
12	12	5	**TT-*LG-012-HNNN**	0.454 (11.5)	87 (129)
24	12	5	**TT-*LG-024-HNNN**	0.454 (11.5)	87 (129)
36	12	5	**TT-*LG-036-HNNN**	0.454 (11.5)	87 (129)

Arctic Grade - All Dielectric, Dry Tube, Double Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
12	12	5	TT-*AD-012-H2NN	0.575 (14.6)	140 (209)
24	12	5	TT-*AD-024-H2NN	0.575 (14.6)	140 (209)
36	12	5	TT-*AD-036-H2NN	0.575 (14.6)	140 (209)

Oil Res II versions available - change PN suffix to -H23N

Corrugated Steel Tape Armor, Double Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TT-*LF-002-HTNN**	0.630 (16.0)	171 (254)
4	4	5	**TT-*LF-004-HTNN**	0.630 (16.0)	171 (254)
6	6	5	**TT-*LF-006-HTNN**	0.630 (16.0)	171 (254)
8	8	5	**TT-*LG-008-HTNN**	0.630 (16.0)	171 (254)
12	12	5	**TT-*LG-012-HTNN**	0.630 (16.0)	171 (254)
24	12	5	**TT-*LG-024-HTNN**	0.630 (16.0)	170 (253)
36	12	5	**TT-*LG-036-HTNN**	0.630 (16.0)	169 (252)

Aluminum Interlock Armor, Double Jacket

# of Fibers	Fibers / Subunit	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	**TT-*LF-002-HINN**	0.805 (20.4)	242 (360)
4	4	5	**TT-*LF-004-HINN**	0.805 (20.4)	242 (360)
6	6	5	**TT-*LF-006-HINN**	0.805 (20.4)	242 (360)
8	8	5	**TT-*LG-008-HINN**	0.805 (20.4)	242 (360)
12	12	5	**TT-*LG-012-HINN**	0.805 (20.4)	242 (360)
24	12	5	**TT-*LG-024-HINN**	0.805 (20.4)	242 (360)
36	12	5	**TT-*LG-036-HINN**	0.805 (20.4)	242 (360)

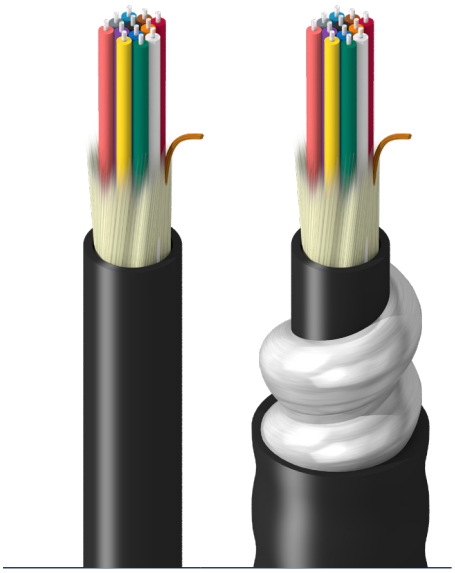
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-armored	Interlock Armored	Corrugated Steel Tape
Max. Install Load, lbs (N)	600 (2670) Arctic: 990 (4400)	600 (2670)	
Max. Long Term Load, lbs (N)	180 (800) Arctic: 290 (1300)	180 (800)	
Crush Resistance (FOTP-41), N/cm	220 Arctic: 440	440	220
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.		
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD	10x Cable OD

RailTuff® Industrial Fiber Cables

Transit-Grade Fiber Cable for Harsh Factory Environments
Distribution Indoor/Outdoor
Low Smoke Zero Halogen (LSZH), NFPA 130 and 502 Compliant



Standards and Ratings

TIA/EIA-568.3-D
NEC/CEC OFNR-ST1 / OFCR-ST1 FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Fiber Buffer OD	900um	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	Unitized Only
Inner Jacket Material/Color	LSZH/Black	Optional
Armor	Aluminum Interlock	Optional
Outer Jacket Material/Color	LSZH/Black	

Options

Black Jacket (Other Colors Available)
Steel Interlock Armor Available

All Dielectric, Single Jacket

# of Fibers	Fibers / Subunit	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	Single Unit	**TT-*D9-002-LNNN**	0.184 (4.7)	13 (19)
4	Single Unit	**TT-*D9-004-LNNN**	0.200 (5.1)	16 (24)
6	Single Unit	**TT-*D9-006-LNNN**	0.220 (5.6)	18 (27)
8	Single Unit	**TT-*D9-008-LNNN**	0.235 (6.0)	23 (34)
12	Single Unit	**TT-*D9-012-LNNN**	0.290 (7.4)	26 (39)
24	12	**TT-*DK-024-LNNN**	0.688 (17.5)	157 (234)
36	12	**TT-*DK-036-LNNN**	0.688 (17.5)	157 (234)
48	12	**TT-*DK-048-LNNN**	0.688 (17.5)	157 (234)
72	12	**TT-*DK-072-LNNN**	0.823 (20.9)	229 (341)
96	12	**TT-*DK-096-LNNN**	0.977 (24.8)	344 (512)
144	12	**TT-*DK-144-LNNN**	1.100 (27.9)	377 (561)

Aluminum Interlock Armor, Double Jacket

# of Fibers	Fibers / Subunit	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	Single Unit	**TT-*D9-002-LINN**	0.535 (13.6)	104 (155)
4	Single Unit	**TT-*D9-004-LINN**	0.550 (14.0)	112 (167)
6	Single Unit	**TT-*D9-006-LINN**	0.570 (14.5)	119 (177)
8	Single Unit	**TT-*D9-008-LINN**	0.585 (14.9)	127 (189)
12	Single Unit	**TT-*D9-012-LINN**	0.640 (16.3)	135 (201)
24	12	**TT-*DK-012-LINN**	1.086 (27.6)	380 (566)
36	12	**TT-*DK-036-LINN**	1.086 (27.6)	380 (566)
48	12	**TT-*DK-048-LINN**	1.086 (27.6)	380 (566)
72	12	**TT-*DK-072-LINN**	1.221 (31.0)	485 (722)
96	12	**TT-*DK-096-LINN**	1.390 (35.3)	639 (951)
144	12	**TT-*DK-144-LINN**	1.510 (38.4)	701 (1043)

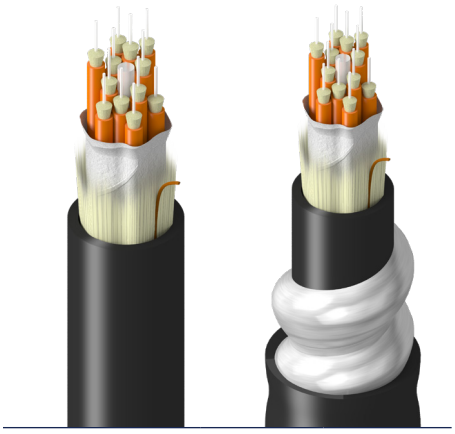
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)	Subunit Color
OS2 - Single Mode	S	1310/1550	0.5/0.5	-	-	5000/-	10,000/40,000	Yellow
OM1 - 62.5/125µm Multi-Mode	1	850/1300	3.5/1.25	200/500	220/-	300/550	33/-	Orange
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-	Aqua
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-	Erika Violet

*OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Interlock Armored
Max. Install Load, lbs (N)	<=12f - 300 (1330) >12f - 600 (2670)	
Max. Long Term Load, lbs (N)	<=12f - 90 (400) >12f - 180 (800)	
Crush Resistance (FOTP-41), N/cm	220	440
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

RailTuff® Industrial Fiber Cables

Transit-Grade Fiber Cable for Harsh Factory Environments
Breakout Indoor/Outdoor
Low Smoke Zero Halogen (LSZH), NFPA 130 and 502 Compliant



Standards and Ratings

TIA/EIA-568.3-D
NEC/CEC OFNR-ST1 / OFCR-ST1 FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Fiber Buffer OD	900um	
Subunit OD	2.0mm	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	Unitized Only
Inner Jacket Material/Color	LSZH/Black	Optional
Armor	Aluminum Interlock	Optional
Outer Jacket Material/Color	LSZH/Black	

Options

Black Jacket (Other Colors Available)
Steel Interlock Armor Available

All Dielectric, Single Jacket			
# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD	Cable Bulk Weight
		in (mm)	lbs/kft (kg/km)
2	**TT-*BB-002-LNNN**	0.260 (6.6)	23 (34)
4	**TT-*BB-004-LNNN**	0.321 (8.2)	29 (43)
6	**TT-*BB-006-LNNN**	0.373 (9.5)	64 (95)
8	**TT-*BB-008-LNNN**	0.435 (11.0)	87 (129)
12	**TT-*BB-012-LNNN**	0.540 (13.7)	109 (162)
18	**TT-*BB-018-LNNN**	0.530 (13.5)	109 (162)

Aluminum Interlock Armor, Double Jacket			
# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD	Cable Bulk Weight
		in (mm)	lbs/kft (kg/km)
2	**TT-*BB-002-LINN**	0.610 (15.5)	130 (193)
4	**TT-*BB-004-LINN**	0.675 (17.1)	152 (226)
6	**TT-*BB-006-LINN**	0.710 (18.0)	170 (253)
8	**TT-*BB-008-LINN**	0.785 (19.9)	160 (238)
12	**TT-*BB-012-LINN**	0.950 (24.1)	242 (360)
18	**TT-*BB-018-LINN**	0.940 (23.9)	242 (360)

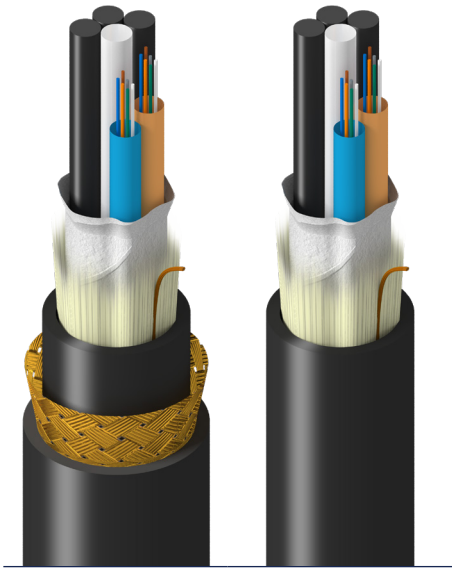
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)	Subunit Color
OS2 - Single Mode	S	1310/1550	0.5/0.5	-	-	5000/-	10,000/40,000	Yellow
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.5/1.25	200/500	220/-	300/550	33/-	Orange
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-	Aqua
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-	Erika Violet

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Interlock Armored
Max. Install Load, lbs (N)	<=12f - 300 (1330) >12f - 600 (2670)	
Max. Long Term Load, lbs (N)	<=12f - 90 (400) >12f - 180 (800)	
Crush Resistance (FOTP-41), N/cm	220	440
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

MarineTuff® Industrial Fiber Cables

Marine-Grade Fiber Cable for Shipboard and Platform Environments
Loose Tube Indoor/Outdoor
Low Smoke Zero Halogen (LSZH)



Standards and Ratings

TIA/EIA-568.3-D
NEC/CEC OFNG-ST1/OFCG-ST1 †Not-ST1 rated
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D
Buffer Tube	Thermoplastic
Strength Member	Aramid Yarn
Central Strength Member	E-glass
Inner Jacket Material/Color	LSZH/Black
Armor	Bronze Braid
Outer Jacket Material/Color	LSZH/Black

Options

Fiber Counts 12-36 Available in a 6F/Tube Design
Black Jacket (Other Colors Available)

Bronze Braid Armor, Double Jacket

# of Fibers	Fibers/Bundle	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	TM-*LF-002-HBAN	0.645 (16.4)	247 (368)
4	4	5	TM-*LF-004-HBAN	0.645 (16.4)	247 (368)
6	6	5	TM-*LF-006-HBAN	0.645 (16.4)	247 (368)
8	8	5	TM-*LG-008-HBAN	0.645 (16.4)	247 (368)
12	12	5	TM-*LG-012-HBAN	0.645 (16.4)	247 (368)
24	12	5	TM-*LG-024-HBAN	0.645 (16.4)	246 (366)
36	12	5	TM-*LG-036-HBAN	0.645 (16.4)	244 (363)
48	12	5	TM-*LG-048-MBAN†	0.645 (16.4)	243 (362)
60	12	5	TM-*LG-060-MBAN†	0.645 (16.4)	242 (360)

All Dielectric, Single Jacket

# of Fibers	Fibers/Bundle	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	5	TM-*LF-002-HNAN	0.460 (11.7)	89 (132)
4	4	5	TM-*LF-004-HNAN	0.460 (11.7)	89 (132)
6	6	5	TM-*LF-006-HNAN	0.460 (11.7)	89 (132)
8	8	5	TM-*LG-008-HNAN	0.460 (11.7)	89 (132)
12	12	5	TM-*LG-012-HNAN	0.460 (11.7)	89 (132)
24	12	5	TM-*LG-024-HNAN	0.460 (11.7)	88 (131)
36	12	5	TM-*LG-036-HNAN	0.460 (11.7)	86 (128)
48	12	5	TM-*LG-048-MNAN†	0.460 (11.7)	85 (126)
60	12	5	TM-*LG-060-MNAN†	0.460 (11.7)	84 (125)
72	12	6	TM-*LG-072-MNAN†	0.480 (12.2)	93 (138)
96	12	8	TM-*LG-096-MNAN†	0.547 (13.9)	112 (167)
144	12	12	TM-*LG-144-MNAN†	0.701 (17.8)	200 (298)

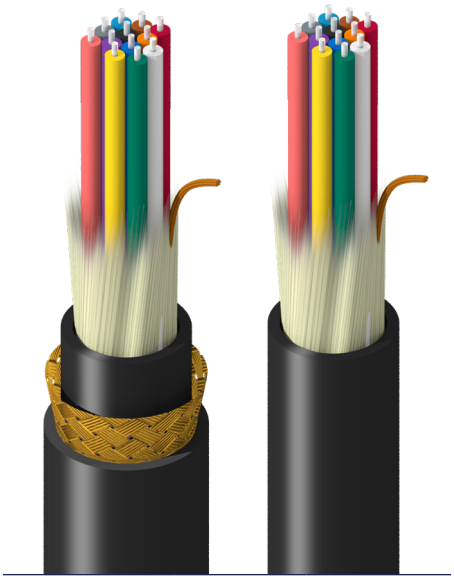
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 -62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 -50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1000/550	400/-

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Bronze Braid Armored
Max. Install Load, lbs (N)	600 (2670)	
Max. Long Term Load, lbs (N)	180 (800)	
Crush Resistance (FOTP-41), N/cm	220	440
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD Radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

MarineTuff® Industrial Fiber Cables

Marine-Grade Fiber Cable for Shipboard and Platform Environments
Distribution Indoor/Outdoor
Low Smoke Zero Halogen (LSZH)



Standards and Ratings

TIA/EIA-568.3-D
NEC/CEC OFNR-ST1/OFCR-ST1 FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Fiber Buffer OD	900um	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	Unitized Only
Inner Jacket Material/Color	LSZH/Black	Optional
Armor	Bronze Braid	Optional
Outer Jacket Material/Color	LSZH/Black	

Options

Black Jacket (Other Colors Available)

Bronze Braid Armor, Double Jacket

# of Fibers	Fibers/Bundle	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	N/A	N/A	**TM-*D9-002-LBAN**	0.360 (9.1)	89 (132)
4	N/A	N/A	**TM-*D9-004-LBAN**	0.375 (9.5)	95 (141)
6	N/A	N/A	**TM-*D9-006-LBAN**	0.395 (10.0)	104 (155)
8	N/A	N/A	**TM-*D9-008-LBAN**	0.410 (10.4)	112 (167)
12	N/A	N/A	**TM-*D9-012-LBAN**	0.465 (11.8)	134 (199)

All Dielectric, Single Jacket

# of Fibers	Fibers/Bundle	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	N/A	N/A	**TM-*D9-002-LNAN**	0.205 (5.2)	18 (27)
4	N/A	N/A	**TM-*D9-004-LNAN**	0.220 (5.6)	21 (31)
6	N/A	N/A	**TM-*D9-006-LNAN**	0.240 (6.1)	25 (37)
8	N/A	N/A	**TM-*D9-008-LNAN**	0.255 (6.5)	28 (42)
12	N/A	N/A	**TM-*D9-012-LNAN**	0.310 (7.9)	36 (54)
24	6	4	**TM-*DJ-024-LNAN**	0.570 (14.5)	112 (167)
36	12	4	**TM-*DK-036-LNAN**	0.688 (17.5)	162 (241)
48	12	4	**TM-*DK-048-LNAN**	0.688 (17.5)	158 (235)
72	12	6	**TM-*DK-072-LNAN**	0.823 (20.9)	235 (350)
96	12	8	**TM-*DK-096-LNAN**	0.977 (24.8)	350 (521)
144	12	12	**TM-*DK-144-LNAN**	1.100 (27.9)	376 (560)

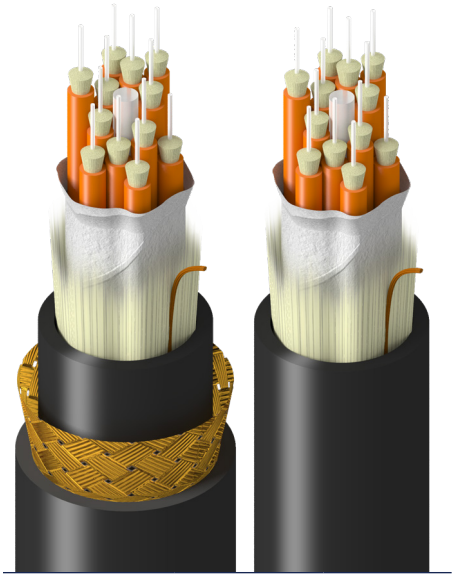
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)	Subunit Color
OS2 - Single Mode	S	1310/1550	0.5/0.5	-	-	5000/-	10,000/40,000	Yellow
OM1 - 62.5/125µm Multi-Mode	1	850/1300	3.5/1.25	200/500	220/-	300/550	33/-	Orange
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-	Aqua
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1000/550	400/-	Erika Violet

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Bronze Braid Armored
Max. Install Load, lbs (N)	<=12f - 300 (1330) >12f - 600 (2670)	
Max. Long Term Load, lbs (N)	<=12f - 90 (400) >12f - 180 (800)	
Crush Resistance (FOTP-41), N/cm	220	440
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD Radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

MarineTuff® Industrial Fiber Cables

Marine-Grade Fiber Cable for Shipboard and Platform Environments
Breakout Indoor/Outdoor
Low Smoke Zero Halogen (LSZH)



Standards and Ratings

TIA/EIA-568.3-D
NEC/CEC OFNR-ST1/OFCR-ST1 FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Fiber Buffer OD	900um	
Subunit OD	2.0mm	
Strength Member	Aramid Yarn	
Central Strength Member	E-glass	>6f Only
Inner Jacket Material/Color	LSZH/Black	Optional
Armor	Bronze Braid	Optional
Outer Jacket Material/Color	LSZH/Black	

Options

Black Jacket (Other Colors Available)

Bronze Braid Armor, Double Jacket

# of Fibers	Fibers/Bundle	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	N/A	N/A	**TM-*BB-002-LBAN**	0.455 (11.6)	126 (188)
4	N/A	N/A	**TM-*BB-004-LBAN**	0.516 (13.1)	154 (229)
6	N/A	N/A	**TM-*BB-006-LBAN**	0.553 (14.0)	191 (284)
8	N/A	N/A	**TM-*BB-008-LBAN**	0.630 (16.0)	231 (344)
12	N/A	N/A	**TM-*BB-012-LBAN**	0.735 (18.7)	307 (457)
18	N/A	N/A	**TM-*BB-018-LBAN**	0.725 (18.4)	297 (442)

All Dielectric, Single Jacket

# of Fibers	Fibers/Bundle	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	N/A	N/A	**TM-*BB-002-LNAN**	0.260 (6.6)	27 (40)
4	N/A	N/A	**TM-*BB-004-LNAN**	0.321 (8.2)	38 (57)
6	N/A	N/A	**TM-*BB-006-LNAN**	0.368 (9.3)	61 (91)
8	N/A	N/A	**TM-*BB-008-LNAN**	0.435 (11.0)	79 (118)
12	N/A	N/A	**TM-*BB-012-LNAN**	0.550 (14.0)	125 (186)
18	N/A	N/A	**TM-*BB-018-LNAN**	0.530 (13.5)	118 (176)

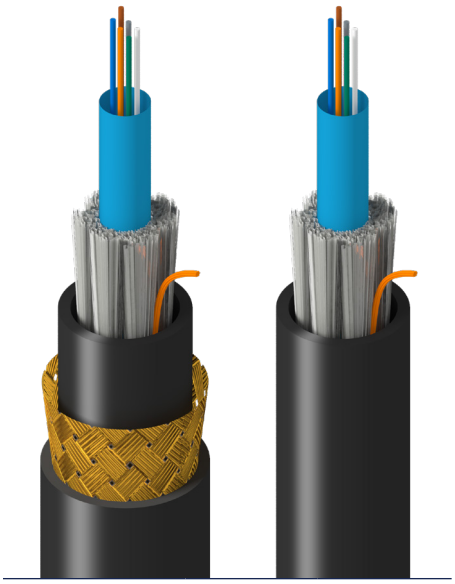
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)	Jacket & Subunit Color
OS2 - Single Mode	S	1310/1550	0.5/0.5	-	-	5000/-	10,000/40,000	Yellow
OM1 - 62.5/125µm Multi-Mode	1	850/1300	3.5/1.25	200/500	220/-	300/550	33/-	Orange
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-	Aqua
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1000/550	400/-	Erika Violet

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Bronze Braid Armored
Max. Install Load, lbs (N)	<=12f - 300 (1330) >12f - 600 (2670)	
Max. Long Term Load, lbs (N)	<=12f - 90 (400) >12f - 180 (800)	
Crush Resistance (FOTP-41), N/cm	220	440
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

MarineTuff® Industrial Fiber Cables

Marine-Grade Fiber Cable for Shipboard and Platform Environments
Central Loose Tube Indoor/Outdoor
Low Smoke Zero Halogen (LSZH)



Standards and Ratings

TIA/EIA-568.3-D
NEC/CEC OFNR/OFCR FT4
ICEA S-104-696
ROHS II 2011/65/EU
REACH EC1907-2006

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-10°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D
Buffer Tube	Thermoplastic
Strength Member	Fiber Glass
Inner Jacket Material/Color	LSZH/Black
Armor	Bronze Braid
Outer Jacket Material/Color	LSZH/Black

Options

Black Jacket (Other Colors Available)

Bronze Braid Armor, Double Jacket

# of Fibers	Fibers/Bundle	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	1	**TM-*C0-002-MBAN**	0.500 (12.7)	158 (235)
4	4	1	**TM-*C0-004-MBAN**	0.500 (12.7)	158 (235)
6	6	1	**TM-*C0-006-MBAN**	0.500 (12.7)	158 (235)
8	8	1	**TM-*C0-008-MBAN**	0.500 (12.7)	158 (235)
12	12	1	**TM-*C0-012-MBAN**	0.500 (12.7)	158 (235)
18	18	1	**TM-*C0-024-MBAN**	0.500 (12.7)	159 (237)

All Dielectric, Single Jacket

# of Fibers	Fibers/Bundle	# of Positions	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD in (mm)	Cable Bulk Weight lbs/kft (kg/km)
2	2	1	**TM-*C0-002-MNAN**	0.315 (8.0)	41 (61)
4	4	1	**TM-*C0-004-MNAN**	0.315 (8.0)	41 (61)
6	6	1	**TM-*C0-006-MNAN**	0.315 (8.0)	41 (61)
8	8	1	**TM-*C0-008-MNAN**	0.315 (8.0)	41 (61)
12	12	1	**TM-*C0-012-MNAN**	0.315 (8.0)	41 (61)
18	18	1	**TM-*C0-024-MNAN**	0.315 (8.0)	42 (63)

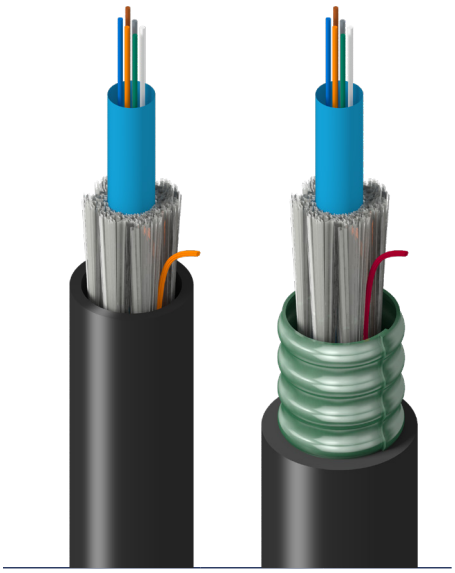
Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 - 62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1000/550	400/-

^OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Bronze Braid Armored
Max. Install Load, lbs (N)	300 (1330)	
Max. Long Term Load, lbs (N)	90 (400)	
Crush Resistance (FOTP-41), N/cm	220	440
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

DataTuff™ Fiber Optic OSP Cables

Outdoor-Grade Fiber Cable for Harsh Environments
Central Loose Tube OSP - Outdoor
PE Jacketed and Rodent Resistant



Standards and Ratings

TIA/EIA-568.3-D
ICEA S-87-640
ROHS II 2011/65/EU
REACH EC1907-2006
Rodent Resistant

Temperature

Operating	-40°C to +70°C
Storage	-40°C to +70°C
Installation	-30°C to +60°C

Materials

Fiber Colors	Per TIA/EIA 598-D	
Buffer Tube	Thermoplastic	
Strength Member	Fiber Glass	
Material/Color	PE/Black	Optional
Armor	Corrugated Steel Tape	Optional
Outer Jacket Material/Color	PE/Black	

Options

Steel and Aluminum Interlock Armor w/ Double Jacket Available (change last two characters of part number to 80 or 70)

All Dielectric, Single Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD	Cable Bulk Weight
		in (mm)	lbs/kft (kg/km)
2	**FS*C002N0**	0.315 (8.0)	33 (49)
4	**FS*C004N0**	0.315 (8.0)	33 (49)
6	**FS*C006N0**	0.315 (8.0)	33 (49)
8	**FS*C008N0**	0.315 (8.0)	33 (49)
10	**FS*C010N0**	0.315 (8.0)	34 (51)
12	**FS*C012N0**	0.315 (8.0)	34 (51)
24	**FS*C024N0**	0.315 (8.0)	34 (51)

Corrugated Steel Tape Armor, Single Jacket

# of Fibers	Part Number[1] [1]Substitute * with Fiber Grade Code	Nom. OD	Cable Bulk Weight
		in (mm)	lbs/kft (kg/km)
2	**FS*C00260**	0.410 (10.4)	71 (106)
4	**FS*C00460**	0.410 (10.4)	71 (106)
6	**FS*C00660**	0.410 (10.4)	71 (106)
8	**FS*C00860**	0.410 (10.4)	71 (106)
10	**FS*C01060**	0.410 (10.4)	72 (107)
12	**FS*C01260**	0.410 (10.4)	72 (107)
24	**FS*C02460**	0.410 (10.4)	72 (107)

Glass Type	Fiber Grade Code (*)	Operating Wavelength (nm)	Attenuation (dB/km)	Min. OFL Bandwidth (MHz·km)	Min. Laser^ Bandwidth (MHz·km)	1 Gigabit Ethernet Min Link Length (m)	10 Gigabit Ethernet Min Link Length (m)
OS2 - Single Mode	S	1310/1550	0.4/0.3	-	-	5000/-	10,000/40,000
OM1 - 62.5/125µm Multi-Mode	1	850/1300	3.25/1.0	200/500	220/-	300/550	33/-
OM3 - 50/125µm Multi-Mode	3	850/1300	3.0/1.0	1500/500	2000/-	1000/550	300/-
OM4 - 50/125µm Multi-Mode	4	850/1300	3.0/1.0	3500/500	4700/-	1100/550	550/-

OM1 is an RML (Restricted Mode Launch) value

Mechanical Specifications	Non-Armored	Armored
Max. Install Load, lbs (N)	300 (1330)	
Max. Long Term Load, lbs (N)	90 (400)	
Crush Resistance (FOTP-41), N/cm	220	440 220 (Corrug. Steel Tape)
Impact Resistance (FOTP-25)	4.4 N·m	4.4 N·m
Cyclic Flexing (FOTP-104)	25 cycles, 20xOD radius Min.	
Min. Bend Radius During Installation	15X Cable OD	20x Cable OD
Min. Bend Radius During Operation	10X Cable OD	10x Cable OD

Notes:

About Belden

Belden Inc., a global leader in high quality, end-to-end signal transmission solutions, delivers a comprehensive product portfolio designed to meet the mission-critical network infrastructure needs of industrial, enterprise and broadcast markets. With innovative solutions targeted at reliable and secure transmission of rapidly growing amounts of data, audio and video needed for today's applications, Belden is at the center of the global transformation to a connected world. Founded in 1902, the company is headquartered in St. Louis, USA, and has manufacturing capabilities in North and South America, Europe and Asia.

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