Nitrotel Manufacturing
Low Voltage Products & Fiber Optic

PRODUCT DATA SHEET

Fiber Optic Jumpers and Pigtails

Description

Nitrotel offers a complete line of fiber optic jumpers and pigtails to service all network applications. Our fiber optic jumpers and pigtails include high quality components and are manufactured to comply with industry standards for optical, mechanical, and environmental performance. The wide selection of connectors, cable types, and lengths ensures that jumpers can be optimized for each unique installation.

As transmission platforms become denser, there is a need to route more fiber through smaller spaces. To accommodate this ever-increasing challenge, the standard fiber cable diameter for jumpers is 2.0 mm. Using 2.0 mm diameter cable can more than double the fiber capacity of overhead fiber routing troughs while making fiber management easier in tightly packed cabinets. There is a 3.0 mm option to match jumpers in legacy networks.

Singlemode jumpers and pigtails use our industry-recognized EasyBand®, while multimode jumpers and pigtails use our and MaxBand® fiber and the connectors may be ordered with standard physical contact (PC), ultra physical contact (UPC) and also angled physical contact (APC) end face finish, to reduce back reflections to less than -65 dB. Multimode jumpers are available with either 62. 5- or 50-micron core sizes to match system requirements. Multimode connectors are polished to a physical contact standard for back reflections lower than -40 dB.

Nitrotel Jumpers are 100% tested to meet rigorous optical, geometric, and surface defect specifications and have demonstrated significant improvements in network performance and reliability for high power, high bit rate systems.

Customized lengths can be ordered in 1-meter increments.

Features

- Singlemode (9/125) and multimode (62.5/125 and 50/125) jumpers in simplex or duplex configuration.
- Connector types include SC, FC, LC, E2000, and MT-RJ.
- Singlemode connectors are available with PC, APC and UPC Type
- Customized fiber lengths, connector pairs, and hybrids can be specified.
- Buffer size: 900 µm
- Jacket PVC or LSZH

Specifications

Specification	Units	Premium Grade
Insertion Loss *(@1310 nm, 1550 nm)* Singlemode Multimode	dB dB	0.20 0.40
Return Loss *(@1310 nm, 1550 nm)* APC ferrule end face finish (singlemode) UPC ferrule end face finish (singlemode) PC (multimode)	 dB dB dB	 >65 >55 >40
End Face Geometry		Tighter tolerances than Telcordia GR-326 Issue 3
Length Tolerance 1 to 10 meter lengths >10 meter lengths	 m m	 ±0.1 ±0.3
Operating Temperature	°C	-40 to +65
Testing for Insertion Loss & Return Loss		100%

RoHS compliant · ISO 14001 · ISO 9001 · CE · Telcordia

EasyBand® Plus Bending Insensitive Single-mode Fiber

Descriptions

Nitrotel EasyBand® Plus bending insensitive single mode fiber combines two attractive features: excellent low macro-bending sensitivity and low water-peak level. It is comprehensively optimized for use in O-E-S-C-L band (1260 -1625 nm). The EasyBand® plus's bending insensitive feature not only guarantees L-band applications but also allows for easy installation without excessive care when storing the fiber especially for Fiber-to-the-Home networks application. Bending radius in fiber guidance ports can be reduced as well as minimum bend radius in wall and corner mountings. Moreover, it has the same mode field diameter as standard single mode fiber, which ensures that it has low connection loss with standard single mode fiber (including fusion splicing and mechanical coupling, etc.) and high power-handling for increased access network capability and flexibility.
Nitrotel EasyBand® Plus bending insensitive single mode fiber meets or exceeds the ITU-T Recommendation G.652.D/G.657.A1/G.657.A2/G.657.B2 including the IEC 60793-2-50 type B1.3/B6 Optical Fiber Specification.

Application

- All types of fiber cables with different structures
- High performance optical network operating in O-E-S-C-L band
- High speed optical routes for Fiber-to-the-Home networks
- Cables with extreme low bending requirements
- Small-sized fiber cable and optical component
- Application in L band (1565-1625 nm)
- 1 & 10 & 40 & 100 Gb/s Ethernet

Process

Nitrotel optical fibers are manufactured using the advanced Plasma Activated Chemical Vapor Deposition (PCVD) process. Because of the inherent advantages of the process, Nitrotel fibers show ultra accurate refractive index (RI) profile control, excellent geometrical performance, low attenuation, etc. High performance bending insensitivity requires a special Freon-Downdoped-Cladding design to prevent the optical field to escape. PCVD is the optimal process to realize such cladding design effectively. The optical fiber is coated with Nitrotel's proprietary dual layer UV curable acrylate. This fiber coating system provides the fiber with superior environmental protection. Designed for more stringent tight-buffer cable application, the fiber also performs perfectly in loose buffer constructions and demonstrates a high resistance to micro-bending. Nitrotel's proprietary coating offers very stable coating strip force over a wide range of environmental conditions with no coating residue on the bare glass fiber. In fiber ribbon constructions, this coating system exhibits excellent performance in 60 watersoak tests, exceeding 100 days. The coated optical fiber has high and stable values for the dynamic stress corrosion susceptibility parameter (nd), which provides greatly improved fiber durability when used in harsh environments.

Characteristics

- Extremely high bending loss resistance in the 7.5 to 15mm bend radius range
- Full compatibility with all G.652 fibers for any application
- Low attenuation satisfying the operation demand in O-E-S-C-L band
- Low PMD satisfying high bit-rate and long distance transmission requirements
- Low micro-bending loss for highly demanding cable designs including ribbons
- Accurate geometrical parameters that insure low splicing loss and high splicing efficiency
- High nd-value satisfying long operational lifetime in minimum bend radius

Nitrotel Manufacturing
Low Voltage Products & Fiber Optic

EasyBand Bending Insensitive Single-Mode Fiber (G657A1)

Characteristics	Conditions	Specified Values	Units
Optical Characteristics			
Attenuation	1310 nm 1383 nm (after H2-aging) 1460 nm 1550 nm 1625 nm	≤ 0.35 ≤ 0.35 ≤ 0.25 ≤ 0.21 ≤ 0.23	[dB/km] [dB/km] [dB/km] [dB/km] [dB/km]
Attenuation vs. Wavelength Max. α difference	1285~1330 nm 1525~1575 nm	≤ 0.03 ≤ 0.02	[dB/km] [dB/km]
Dispersion coefficient	1285~1340 nm 1550 nm 1625 nm	≥-3.4 ≤3.4 ≤18 ≤22	[ps/(nm·km)] [ps/(nm·km)] [ps/(nm·km)]
Zero dispersion wavelength		1300 1324	[nm]
Zero dispersion slope Typical value		≤ 0 092 0.086	[ps/(nm2·km)] [ps/(nm2·km)]
PMD Maximum Individual Fibre Link Design Value (M=20,Q=0.01%) Typical value		≤ 0.1 ≤ 0.06 0.04	[ps/ km] [ps/ km] [ps/ km]
Cable cutoff wavelengthλ cc		≤ 1260	[nm]
Mode field diameter (MFD)	1310 nm 1550 nm	8.4 9.2 9.3 10.3	[μm] [μm]
Effective group index of refraction (N_{eff})	1310 nm 1550 nm	1.466 1.467	
Point discontinuities	1310 nm 1550 nm	≤ 0.05 ≤ 0.05	[dB] [dB]
Geometrical Characteristics			
Cladding diameter		125.0± 0.7	[μm]
Cladding non-circularity		≤ 0.7	[%]
Coating diameter		245± 5	[μm]
Coating-cladding concentricity error		≤ 12.0	[μm]
Coating non-circularity		≤ 6.0	[%]
Core-cladding concentricity error		≤ 0.5	[μm]
Curl (radius)		≥ 4	[m]
Delivery length		2.1 to 50.4	[km/reel]
Environmental Characteristics	(1310 nm, 1550 nm & 1625 nm)		
Temperature dependence Induced attenuation at	-60 to +85	≤ 0.05	[dB/km]
Temperature-humidity cycling Induced attenuation at	-10 to +85 , 98% RH	≤ 0.05	[dB/km]
Watersoak dependence Induced attenuation at	23 , for 30 days	≤ 0.05	[dB/km]
Damp heat dependence Induced attenuation at	85 and 85% RH, for 30 days	≤ 0.05	[dB/km]
Dry heat aging at	85 , for 30 days	≤ 0.05	[dB/km]
Mechanical Specification			
Proof test	off line	≥ 9.0 ≥ 1.0 ≥ 100	[N] [%] [kpsi]
Macro-bend induced attenuation 10 turns around a mandrel of 15 mm radius 10 turns around a mandrel of 15 mm radius 1 turn around a mandrel of 10 mm radius 1 turn around a mandrel of 10 mm radius	1550 nm 1625 nm 1550 nm 1625 nm	≤ 0.25 ≤ 0.1 ≤ 0.75 ≤ 1.5	[dB] [dB] [dB] [dB]
Coating strip force	average torce (typical) peak force	1.7 ≥ 1.3 ≤ 8.9	[N] [N]
Dynamic stress corrosion susceptibility	parameter nd (typical)	20	

RoHS compliant Telcordia

Nitrotel Manufacturing
Low Voltage Products & Fiber Optic

MaxBand® OM2+/0M3/0M4 Multimode Fiber

NITROTEL MaxBand at OM2+ Multimode Fiber complies with or exceeds ISO/IEC 11801 Om2 specification, IEC 60793-2-10 type A1a.1 Optical Fiber Specification, and TIA/EIA-492AAAB-A detail specification.

NITROTEL MaxBand at OM3/0M4 Multimode Fibers comply with or exceed ISO/IEC 11801 OM3/0M4 specification, IEC 60793-2-10 type A1a.2 and A1a.3 Optical Fiber Specification, and TIA/EIA-492AAAC/492AAAD detail specification.

Features
- 850nm laser-optimized
- Extremely refined refractive index profile
- Low differential mode delay (DMD)
- Low attenuation
- Superior geometry, uniformity

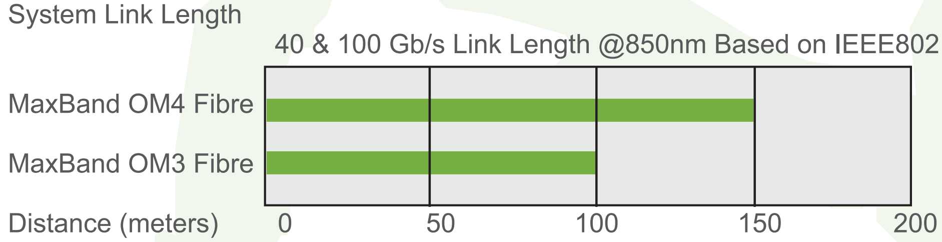
- Coated with Nitrotel's proprietary dual applications layer UV curable acrylate

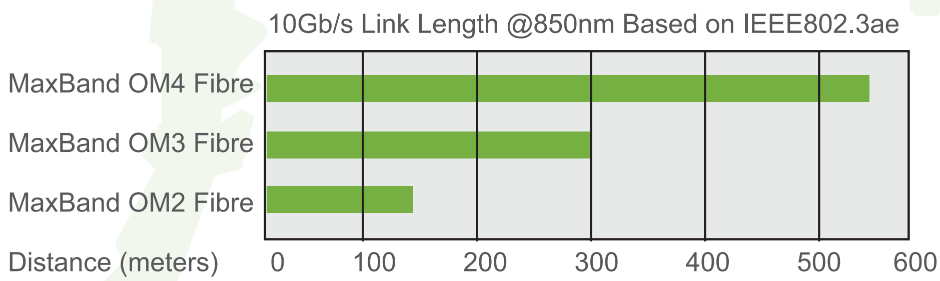
Benefits and Applications
- Data centers
- Storage Area Networks
- High performance computing centers
- Central offices
- Local Area Networks
- 1 & 10 & 40 & 100 Gb/s Ethernet

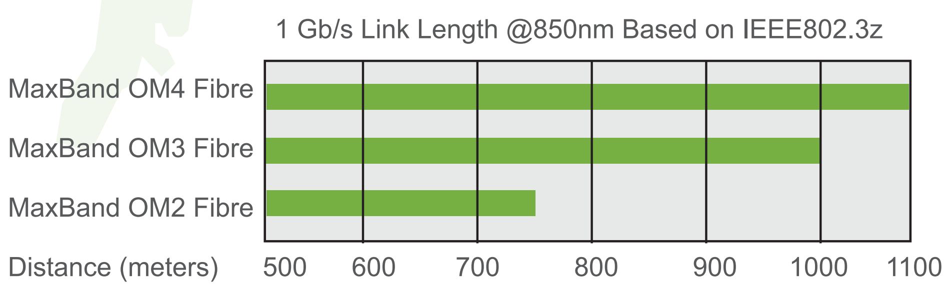
- Optimized performance in tight-buffer cable

- High resistance to micro-bending
-Stable performance over a wide range of environmental conditions

System Link Length







RoHS compliant · ETL · ISO 14001 · ISO 9001 · CE · Telcordia

786.409.3741 sales@nitrotelmanufacturing.com WEB www.nitrotelmanufacturing.com

Nitrotel Manufacturing
Low Voltage Products & Fiber Optic

Nitrotel MaxBand ® OM2+/OM3/OM4 Multimode Fiber

Characteristics	Conditions	Specified Values	Units
Geometry Characteristics			
Core Diameter		50 ± 2.5	[μm]
Core Non–Circularity		≤5.0	[%]
Cladding Diameter		125.0 ± 1.0	[μm]
Cladding Non–Circularity		≤1.0	[%]
Coating Diameter		245 ± 7	[μm]
Coating/Cladding Concentricity Error		≤10.0	[μm]
Coating Non–Circularity		≤6.0	[%]
Core/Cladding Concentricity Error		≤1.0	[μm]
Delivery Length		Up to 8.8	[km/reel]
Optical Characteristics			
Attenuation	850nm 1300nm	≤2.4 ≤0.6	[dB/km] [dB/km]
		MaxBand® OM2+/OM3/OM4	
Overfilled Modal Bandwidth	850nm 1300nm	≥700/≥1500/≥3500 ≥500/≥500/≥500	[MHz • km] [MHz • km]
Effective Modal Bandwidth	850nm	≥950/≥2000/≥4700	[MHz • km]
Application support distance on			
40 & 100 Gigabit Ethernet	850nm	–/100/150	[m]
10GBASE–SR	850nm	150/300/550	[m]
1000BASE–SX	850nm	750/1000/1100	[m]
DMD Specification	Compliant with and more stringent than the requirements of IEC 60793–2–10		
Numerical Aperture		0.200 ± 0.015	
Group Refractive Index	850nm 1300nm	1.482 1.477	
Zero Dispersion Wavelength, λ_0		1295–1340	[nm]
Zero Dispersion Slope, S_0	1295nm≤ λ_0 ≤1310nm 1310nm≤ λ_0 ≤1340nm	≤0.105 ≤0.000375(1590– λ_0)	[ps/(nm² • km)] [ps/(nm² • km)]
Macrobending Loss 100 Turns @ 37.5mm Radius 2 Turns @15 mm Radius	 850nm 1300nm 850nm 1300nm	 ≤0.50 ≤0.50 ≤1.0 ≤1.0	 [dB] [dB] [dB] [dB]
Backscatter Characteristics	1300nm		
Step (Mean of Bidirectional Measurement)		≤0.10	[dB]
Irregularities Over Fibre Length and Point Discontinuity		≤0.10	[dB]
Attenuation Uniformity		≤0.08	[dB/km]
Environmental Characteristics			
Temperature Cycling	–60℃ to +85℃	≤0.10	[dB/km]
Temperature–Humidity Cycling	–10℃ to +85℃, 4% to 98% RH	≤0.10	[dB/km]
Water Immersion	23℃, 30 days	≤0.10	[dB/km]
Dry Heat	85℃, 30 days	≤0.10	[dB/km]
Damp Heat	85℃, 85% RH, 30 days	≤0.10	[dB/km]
Mechanical Specification			
Proof Test		≥9.0 ≥1.0 ≥100	[N] [%] [kpsi]
Coating Strip Force	typical average force peak force	1.5 ≥1.3 ≤8.9	[N] [N]
Dynamic Stress Corrosion Susceptibility Parameter (n_d, typical)		27	

RoHS compliant · ETL · ISO 14001 · ISO 9001 · CE · Telcordia