

OPTICAL FIBER WIRE & CABLE

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OPTICAL FIBER INFORMATION

The optical fiber is an ITU-T Recommendation G.625.D compliant optical fiber with Corning's enhanced low-loss and bend fiber technologies. This full-spectrum fiber has bend performance that exceeds the ITU-T Recommendation G.657.A1 standard and still splices the same as the installed base of standard single-mode fibers specifications for attenuation, macrobend loss, and polarization mode dispersion values, which provide a solid foundation for new network deployments as well as upgrades to existing networks.



Optical Specifications

Maximum Attenuation

Wavelength (nm)	Maximum Value* (dB/km)
1310	≤ 0.32
1383**	≤ 0.32
1490	≤ 0.21
1550	≤ 0.18
1625	≤ 0.20

* Alternate attenuation offerings available upon request.

** Attenuation values at this wavelength represent post-hydrogen aging performance.

Attenuation VS. Wavelength

Range (nm)	Ref. λ (nm)	Max. α Difference (dB/km)
1285-1330	1310	0.03
1525-1575	1550	0.02

The attenuation in a given wavelength range does not exceed the attenuation of the reference wavelength (λ) by more than value α.

Macrobend Loss

Mandrel Radius (mm)	Number Of Turns	Wavelength (nm)	Induced Attenuation* (dB)
30	1	1550	≤ 0.03
50	100	1310	≤ 0.03
50	100	1550	≤ 0.03
60	100	1625	≤ 0.03

* The induced attenuation due to fiber wrapped around a mandrel of a specified diameter.

Point Discontinuity

Wavelength (nm)	Point Discontinuity (dB)
1310	≤ 0.05
1550	≤ 0.05

* The induced attenuation due to fiber wrapped around a mandrel of a specified diameter.

Cable Cutoff Wavelength (λ_{cc})

$$\lambda_{cc} \leq 1260 \text{ nm}$$

Mode-Field Diameter

Wavelength (nm)	MFD (μm)
1310	9.2 ± 0.4
1550	10.4 ± 0.5

The attenuation in a given wavelength range does not exceed the attenuation of the reference wavelength (λ) by more than value α.

Dispersion

Wavelength (nm)	Dispersion Value [ps/(nm-km)]
1550	≤ 18.0
1625	≤ 22.0

Zero Dispersion Wavelength (λ₀): 1304 nm ≤ λ₀ ≤ 1324 nm

Zero Dispersion Slope (s₀): ≤ 0.092 ps/(nm² • km)

Polarization Mode Dispersion (PMD)

PMD link Design Value	≤ 0.06*
Maximum Individual fiber PMD	≤ 0.10

*Complies with IEC 60794-3: 2001, Section 5.5, Method 1, (m = 20, Q = 0.01%), September 2001.

The PMD link design value is a term used to describe the PMD of concatenated lengths of fiber (also known as PMD). This value represents a statistical upper limit for total link PMD. Individual PMD values may change when fiber is cabled.

Dimensional Specifications

Glass Geometry

Fiber Curl	≥ 4.0 m radius of curvature
Cladding Diameter	125.0 ± 0.7 μm
Core-Clad Concentricity	≤ 0.5 μm
Cladding Non-Circularity	≤ 0.7%

Coating Geometry

Coating Diameter	242 ± 5 μm
Coating-Cladding Concentricity	< 12 μm

Environmental Specifications

Glass Geometry

Environmental Test	Test Condition	Induced Attenuation 1310 nm, 1550 nm, and 1625 nm (db /km)
Temperature Dependence	-60°C to +85°C*	≤ 0.05
Temperature Humidity Cycling	-10°C to +85°C up to 98% RH	≤ 0.05
Water Immersion	23°C ± 2°C	≤ 0.05
Heat Aging	85°C ± 2°C	≤ 0.05
Damp Heat	85°C at 85% RH	≤ 0.05

*Reference temperature = +23°C
Operating Temperature Range: -60°C to +85°C

Mechanical Specifications

Proof test

The entire fiber length is subjected to a tensile stress ≥ 100 kpsi (0.69 GPa).*

*Higher proof test levels available

Performance Characterizations

Characterized parameters are typical values.

Core Diameter	8.2 μm
Numerical Aperture	0.14 NA is measured at the one percent power level of a one-dimensional far-field scan at 1310 nm.
Effective Group Index of Refraction (Neff)	1310 nm: 1.4676 1550 nm: 1.4682
Fatigue Resistance Parameter (Nd)	20
Coating Strip Force	Dry: 0.6 lbs. (3N) Wet, 14-day room temperature : 0.6 lbs (3N)
Rayleigh Backscatter Coefficient (for 1 ns Pulse Width)	1310 nm: -77 dB 1550 nm: -82 dB



TECHNICAL CHARACTERISTICS

- ◆ Low loss, low dispersion
- ◆ Proper design and precise excess length control and cabling process offers cable superior mechanical and environmental properties

Performance

- ◆ Applicable to long distance, inter-exchange communication, CATV, computer network transmission system, etc.
- ◆ Minimum bend radius: static 10D, Dynamic 20D
- ◆ Operation temperature: -10 to +70

Cable Specification

Fiber color code						
No.	1	2	3	4	5	6
Color	Blue	Orange	Green	Brown	Gray	White
No.	7	8	9	10	11	12
Color	Red	Black	Yellow	Violet	Pink	Aqua
No.	13	14	15	16	17	18
Color	Blue+BK*	Orange+BK	Green+BK	Brown+BK	Gray+BK	White+BK
No.	19	20	21	22	23	24
Color	Red+BK	Natural+BK	Yellow+BK	Violet+BK	Pink+BK	Aqua+BK

* BK = Black

Cable structure and parameter

Fiber number	Tube Diameter	Messenger strand steel wire diameter	Sheath thickness (nominal*)	Diameter W*H (Nominal*)	Weight (Approx.)
	mm	No. / mm	mm	mm	kg/km
12	2.0	7 / 1.32	1.5	7.3*14.3	116
24	2.4	7 / 1.32	1.5	7.9*14.9	125

Fiber characteristic

All characteristics of the cable fiber (fiber of finished cable) shall be, at least, in accordance with the ITU-T Recommendation G.657A / G.652D / G.655

Characteristic of Optical Cable

4.1 Cable bending radius:

10 x cable diameter (during operation)

20 x cable diameter (during installation)

4.2 Temperature range

Operating temperature range	- 10°C to + 70°C-
Storage / Transport temperature range	-10°C to +70°C
Installation temperature range	~ 32°C

4.3 Main mechanical & environmental characteristics tes

1 Tensile Strength	As per IEC 60794-1-2-E1
2 Crush Test	As per IEC 60794-1-2-E3
3 Impact Test	As per IEC 60794-1-2-E4
4 Repeated Bending	As pe IEC 60794-1-2-E6.
5 Torsion	As pe IEC 60794-1-2-E7
6 Water Penetration	As pe IEC 60794-1-2-F5B
7 Temperature Cycling	As pe IEC 60794-1-2-F1