

# Optical Fiber Specifications

## Single Mode

Single Mode Fiber Types	Reduced	Zero	TeraFlex® Bend Resistant			NZDS
	Water Peak	Water Peak	G.657.A1	G.657.A2	G.657.B3	
	9-Digit Part Number Designator	2	K	J	L	
16-Digit Part Number Designator	10	17	13	14	15	19

Parameter	Test Method/Standard	Units	Wavelength	Cable Type						
Maximum Attenuation	ANSI/TIA-455-78-B-2002	dB/km	1310 nm	Tight Buffer	0.70	0.70	0.70	0.70	0.70	-
				Loose Tube	0.35	0.35	0.35	0.35	0.35	-
			1383 nm	Tight Buffer	0.70	0.70	0.70	0.70	0.70	-
				Loose Tube	0.35	0.31	0.35	0.35	0.35	-
			1490 nm	Tight Buffer	0.70	0.70	0.70	0.70	0.70	0.70
				Loose Tube	0.25	0.25	0.25	0.25	0.25	0.30
			1550 nm	Tight Buffer	0.70	0.70	0.70	0.70	0.70	0.70
				Loose Tube	0.25	0.25	0.25	0.25	0.25	0.30
			1625 nm	Tight Buffer	0.70	0.70	0.70	0.70	0.70	0.70
				Loose Tube	0.25	0.25	0.25	0.25	0.25	0.25
Typical Attenuation	ANSI/TIA-455-78-B-2002	dB/km	1310 nm	Tight Buffer	0.41	0.41	0.41	0.41	0.41	-
				Loose Tube	0.34	0.34	0.34	0.34	0.34	-
			1383 nm	Tight Buffer	0.41	0.41	0.41	0.41	0.41	-
				Loose Tube	0.33	0.31	0.31	0.31	0.31	-
			1550 nm	Tight Buffer	0.41	0.41	0.41	0.41	0.41	0.41
				Loose Tube	0.19	0.19	0.19	0.19	0.19	0.25

Parameter	Test Method/Standard	Units	Conditions						
Nominal Group Refractive Index	-	-	1310 nm	1.467	1.467	1.467	1.467	1.467	1.467
			1550 nm	1.468	1.468	1.468	1.468	1.468	1.468
Maximum Individual Fiber Polarization Mode Dispersion	ANSI/TIA/EIA-455-113-96	ps/vkm	-	0.2	0.2	0.2	0.2	0.2	0.2
Cable Cutoff Wavelength	ANSI/TIA-455-80-C-2003	nm	-	1260	1260	1260	1260	1260	1260
Zero Chromatic Dispersion Wavelength	ANSI/TIA-455-175-B-2003	nm	-	1300-1324	1300-1324	1300-1324	1304-1324	1304-1324	N/A
Typical Chromatic Dispersion Slope	ANSI/TIA-455-175-B-2003	ps/nm <sup>2</sup> -km	-	0.087	0.087	0.087	0.087	0.087	0.047
Proof Strength	ANSI/TIA/EIA-455-31-C-2005	kpsi	On-line	100	100	100	100	100	100
			Off-line	0.69	0.69	0.69	0.69	0.69	0.69
Mode Field Diameter	ANSI/TIA-455-191-B-2003	μm	1310 nm	8.8-9.6	8.8-9.6	8.8-9.6	8.2-9.2	8.2-9.2	N/A
			1550 nm	9.9-10.9	9.9-10.9	9.9-10.9	9.1-10.1	9.1-10.1	7.8-10.0
Maximum Macrobend Attenuation Increase	ANSI/TIA-455-62-B-2003	dB	1310 nm 100 turns on 50 mm mandrel	0.05	0.05	0.01	0.01	0.01	0.05
			1550 nm 1 turn on 15 mm mandrel	-	-	-	0.03	0.01	-
			1550 nm 1 turn on 10 mm mandrel	-	-	-	0.20	0.03	-
			-	-	-	-	-	-	
Cladding Diameter	ANSI/TIA-455-176-A-2003	μm	-	125.0 ± 0.9	125.0 ± 0.9	125.0 ± 0.7	125.0 ± 0.7	125.0 ± 0.7	125.0 ± 0.7
Coating Diameter	ANSI/TIA-455-176-A-2003	micron	-	250 ± 10	250 ± 10	250 ± 10	250 ± 10	250 ± 10	250 ± 10
Maximum Core/Clad Concentricity Error	ANSI/TIA-455-176-A-2003	μm	-	0.5	0.5	0.5	0.5	0.5	0.5
Max. Cladding Non-Circularity	ANSI/TIA-455-176-A-2003	%	-	1	1	1	0.7	0.7	0.7
Maximum Coating/Cladding Concentricity Error	ANSI/TIA-455-176-A-2003	μm	-	12	12	12	12	12	12

Guaranteed Supportable Ethernet Distances	Data Rate	Protocol	Units	Wavelength	Maximum Transmission Distances					
	1 Gbps	1000BASE-LH, 1000BASE-LH-LX	km	1310 nm	10	10	10	10	10	10
km			1550 nm	70	70	70	70	70	70	
10 Gbps	10GBASE-LR	km	1310 nm	25	25	25	25	25	25	
		km	1550 nm	40	40	40	40	40	40	
40 Gbps	40GBASE-LR4	km	1550 nm	80	80	80	80	80	80	
		km	1550 nm	10	10	10	10	10	10	
100 Gbps	100GBASE-LR4	km	1550 nm	10	10	10	10	10	10	
		km	1550 nm	40	40	40	40	40	40	

Fiber Channel Link Distances	Throughput Per Direction	Speed Name	Units	Wavelength	Maximum Link Distance					
	100 MBps	1GFC	meters	1310 nm	10,000	10,000	10,000	10,000	10,000	10,000
200 MBps	2GFC	meters	1310 nm	10,000	10,000	10,000	10,000	10,000	10,000	
400 MBps	4GFC	meters	1310 nm	10,000	10,000	10,000	10,000	10,000	10,000	
800 MBps	8GFC	meters	1310 nm	10,000	10,000	10,000	10,000	10,000	10,000	
1200 MBps	10GFC	meters	1310 nm	10,000	10,000	10,000	10,000	10,000	10,000	
1600 MBps	16GFC	meters	1310 nm	10,000	10,000	10,000	10,000	10,000	10,000	

Standards	ISO/IEC	Tight Buffer	11801: OS1	11801: OS1	11801: OS1	11801: OS1	11801: OS1	-
		Loose Tube	24702: OS2	24702: OS2	24702: OS2	24702: OS2	24702: OS2	-
	Telcordia	GR-20-CORE						
	ITU-T	G.652.D	G.652.D	G.652.D G.657.A1	G.652.D G.657.A2	G.652.D G.657.B3	G.655.C, E G.656	
	TIA-492	CAAB	CAAB	CAAB	CAAB	CAAB	N/A	
	IEC 60793-2-50 Type	B1.3	B1.3	B1.3	B1.3	B1.3	-	
	ANSI/ICEA	Tight Buffer	S-83-596					
		Loose Tube	S-87-640					
	RUS	Loose Tube	PE-90					

# Optical Fiber Specifications

Multimode

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OSP CABLE

FTTP

WIRELESS

TECHNICAL INFO

PART NUMBER INDEX

Multimode Fiber Types		TeraGain® 62.5/125	TeraGain 50/125	TeraGain Laser Optimized 50/125			TeraFlex® Bend Resistant Laser Optimized 50/125			
		10G/150	10G/300	10G/550	10G/150	10G/300	10G/550	10G/150	10G/300	10G/550
9-Digit Part Number Designator		6	5	A	B	F	M	N	P	
16-Digit Part Number Designator		23	21	27	29	31	28	30	32	

Cable Performance	Parameter	Test Method/Standard	Units	Wavelength	Cable Type							
	Maximum Attenuation	TIA/EIA-455-78	dB/km	850 nm	Tight Buffer/ Loose Tube	3.5	3.5	3.5	3.5	3.5	3.5	3.5
		TIA/EIA-455-78	dB/km	1300 nm	Tight Buffer/ Loose Tube	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Typical Attenuation	TIA/EIA-455-78	dB/km	850 nm	Tight Buffer/ Loose Tube	3.0	3.0	3.0	3.0	3.0	3.0	3.0
TIA/EIA-455-78		dB/km	1300 nm	Tight Buffer/ Loose Tube	2.7	2.2	2.2	2.2	2.2	2.2	2.2	

Fiber Performance	Parameter	Test Method/Standard	Units	Conditions											
	Numerical Aperture	ANSI/TIA-455-177-B-2003	-	-	0.275 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	
	Nominal Group Refractive Index	OTDR	-	850 nm	1.496	1.483	1.483	1.483	1.483	1.483	1.483	1.483	1.483	1.483	
				1300 nm	1.491	1.479	1.479	1.479	1.479	1.479	1.479	1.479	1.479	1.479	
	Macrobend Attenuation Change	ANSI/TIA-455-62-B-2003	dB	100 turns on 75 mm Mandrel	850 nm	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	
					1300 nm	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	
				2 turns on 30 mm Mandrel	850 nm	-	-	-	-	-	-	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
					1300 nm	-	-	-	-	-	-	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.3
	2 turns on 15 mm Mandrel	850 nm	-	-	-	-	-	-	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2			
		1300 nm	-	-	-	-	-	-	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5			
	Proof Strength	TIA/EIA-455-31	kpsi	On-line	100	100	100	100	100	100	100	100	100		
				GPa	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69		
	Cladding Diameter	ANSI/TIA-455-176-A-2003	micron	-	125 ± 2	125 ± 2	125 ± 2	125 ± 2	125 ± 2	125 ± 2	125 ± 2	125 ± 2	125 ± 2		
	Coating Diameter	ANSI/TIA-455-176-A-2003	micron	-	250 ± 10	250 ± 10	250 ± 10	250 ± 10	250 ± 10	250 ± 10	250 ± 10	250 ± 10	250 ± 10		
	Core/Clad Concentricity Error	ANSI/TIA-455-176-A-2003	microns	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
Cladding Non-Circularity	ANSI/TIA-455-176-A-2003	%	-	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%			
Coating/Clad Concentricity Error	ANSI/TIA-455-176-A-2003	microns	-	12 µm	12 µm	12 µm	12 µm	12 µm	12 µm	12 µm	12 µm	12 µm			
Minimum Bandwidth: Overfilled Launch	TIA/EIA-455-124-2000	MHz-km	850 nm	220	500	700	1,500	3,500	700	1,500	3,500				
1300 nm			600	500	500	500	500	500	500						
Minimum Bandwidth: Laser Effective Modal Bandwidth	TIA-455-220-A	MHz-km	850 nm	N/A	N/A	950	2,000	4,700	950	2,000	4,700				
1300 nm			N/A	N/A	500	500	500	500	500	500					

Guaranteed Supportable Ethernet Distances	Data Rate	Protocol	Units	Wavelength	Maximum Transmission Distances								
	10 Mbps	10BASE-FL	meters	850 nm	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
	100 Mbps	100BASE-SX	meters	850 nm	500	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		100BASE-FX	meters	1300 nm	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
	1 Gbps	1000BASE-SX	meters	850 nm	300	750	1,000	1,000	1,040	1,000	1,000	1,040	
		1000BASE-LX	meters	1300 nm	600*	600*	600	600	600	600	600	600	
	10 Gbps	10GBASE-SR	meters	850 nm	35	82	150	300	550	150	300	550	
		10GBASE-LRM	meters	1300 nm	300	300	300	300	300	300	300	300	
	40 Gbps	40GBASE-SR4	meters	850 nm	-	-	-	100	125	-	100	125	
	100 Gbps	100GBASE-SR10	meters	850 nm	-	-	-	100	125	-	100	125	

\*Mode conditioning patch cord required

Fiber Channel Link Distances	Throughput Per Direction	Speed Name	Units	Wavelength	Maximum Link Distance							
	100 MBps	1GFC	meters	850 nm	300	500	500	860	*	500	860	*
	200 MBps	2GFC	meters	850 nm	150	300	300	500	*	300	500	*
	400 MBps	4GFC	meters	850 nm	50	150	150	380	400	150	380	400
	800 MBps	8GFC	meters	850 nm	21	50	50	150	190	50	150	190
	1200 MBps	10GFC	meters	850 nm	33	82	82	300	*	82	300	*
	1600 MBps	16GFC	meters	850 nm	15	35	35	100	125	35	100	125

\*The link distance on OM4 fiber has not been defined for these speeds.

Standards	ISO/IEC 11801	OM1	OM2	OM2	OM3	OM4	OM2	OM3	OM4
	Telcordia	GR-20-CORE							
	ITU-T	G.651.1							
	TIA-492	AAAA-A	AAAB	AAAB	AAAC-A	AAAD	AAAB-A	AAAC-B	AAAD
	IEC 60793-2-10 Type	A1b	A1a.1	A1a.1	A1a.2	A1a.3	A1a.1	A1a.2	A1a.3
	ANSI/ICEA	Tight Buffer	S-83-596						
Loose Tube	S-87-640								