Draka Comteq
ESMF Type: G.652.D

Draka Comteq Enhanced Singlemode (ESMF) fiber provides improved performance across the entire 1260 nm to 1625 nm wavelength spectrum. It has a low dispersion in the 1310 nm window and low attenuation in the 1383 nm water-peak region to allow use of the extended band (1360 nm to 1460 nm).

With its wide operating spectrum, ESMF expands the future growth capability of the fiber and allows flexible configuration of voice, data, and video services within the fiber. It can be used in all cable constructions including loose tube, ribbon, central tube and tight buffered designs.

The tighter geometrical, attenuation of ESMF and PMD specifications enables superior performance in long haul, metropolitan, access and premise applications in telecommunications, CATV and utility networks. ESMF is completely interchangeable with standard singlemode fiber.

Draka Comteq's Advanced Plasma and Vapor Deposition (APVD™) manufacturing process ensures the highest quality and purity of fibers. Proprietary AFC™ coating with ColorLock™ further enhances the performance, durability and reliability of the fiber, even in the harshest environments..

Features	Benefits
Low 1383 nm (water peak) attenuation	> Provides expanded fiber capacity and cost savings through use of cheaper lasers in the 1260 nm to 1625 nm range multiplexing filters, and higher number of channels
Low hydrogen sensitivity	> Low attenuation in the 1383 nm region even as fiber ages, for improved performance and long life
Lower PMD of 0.08 ps/√km link design value	> Extends the PMD distance performance, reducing regeneration costs
Lower 1460 nm attenuation (<0.25 dB/km)	> Easy design of low cost laser and filter based systems over a wide wavelength region > Ensue efficient Raman pumping for c-band amplification
Proprietary APVD™ manufacturing process	> Superior geometry, uniformity and purity
Revolutionary ColorLock™ coating process	> Increased reliability, durability, and superior aging performance, resulting in lower maintenance and replacement costs > Makes color a component of the coating, thus enhancing fiber identification and colored fiber reliability > Consistent, vibrant color for ease-of-use and flexibility

Key Industry-Leading Milestones	
1993	Introduced Alcatel's AFC™ coating process for superior aging performance
1994	Introduced Alcatel's proprietary Advanced Plasma and Vapor Deposition (APVD™) fiber production process to ensure the highest quality fiber
1996	Developed and introduced ColorLock™, enhancing fiber identification and colored fiber reliability
2001	Introduced ESMF, offering improved aged water peak performance, reduced attenuation, and enhanced PMD performance.

Draka Comteq ESMF delivers improved attenuation, dispersion, and PMD performance, in addition to opening up the 1383nm water-peak region for useful trans-mission. It is suitable for all applications in which standard singlemode fiber is used.

As the world's leading supplier of telecomm-unications infrastructure, Draka Comteq has the expertise, technology, and resources to deliver an end-to-end solution.

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Draka Comteq Enhanced Singlemode Fiber meets or exceeds ITU G652 including tables C&D, IEC 60793-2-50 type B.1.3 including annex C, ANSI/ICEA S-87-640, Telcordia GR-20-CORE, and RUS 7CFR 1755.900.

Optical Specifications (uncabled fiber)

Attenuation	*Max Value Range (dB/km)*
Attenuation at 1310 nm	0.33 – 0.35
Attenuation at 1383 nm H2 aged*	0.32 – 0.35
Attenuation at 1550 nm	0.19 – 0.21
Attenuation at 1625 nm	0.20 – 0.23
Attenuation at 1460 nm	≤ 0.25
Other values available on request	

Attenuation Uniformity
No point discontinuity greater than 0.05 dB at 1310 nm and 1550 nm.

Attenuation vs.Wavelength
Maximum attenuation change over the window from reference

Wavelength (nm)	*Reference*	*Change (dB/km)*
1285–1330	1310	≤ 0.03
1525–1575	1550	≤ 0.02
1460–1625	1550	≤ 0.04

Attenuation with Bending

100 turns, 50mm diameter @ 1310 nm	≤ 0.05 dB
100 turns, 50mm diameter @ 1550 nm	≤ 0.05 dB
100 turns, 60mm diameter @ 1550 nm and 1625 nm	≤ 0.05 dB
1 turn, 32mm diameter @ 1550 nm	≤ 0.5 dB

Wavelength

Cutoff wavelength (cabled)	≤ 1260 nm
Zero dispersion wavelength	1300 – 1322 nm

Dispersion Slope

Zero dispersion slope	< 0.090 ps/nm²*km

Dispersion vs. Wavelength

Wavelength (nm)	*Dispersion (ps/nm*km)*
1285–1330	≤ 3
1550	≤ 18.0
1625	≤ 22.0

PMD

PMD link design value**	≤ 0.08ps/√km
Max individual fiber	≤ 0.20ps/√km

Dimensional Specifications

Mode field diameter @1310 nm	9.2 ± 0.4 µm
@1550 nm	10.3 ± 0.5 µm
Fiber outside diameter	125.0 ± 0.7 µm
Core/cladding offset	≤ 0.5 µm
Fiber non-circularity	≤ 0.7%
Colored coating outside diameter	242 ± 7 µm
Colored coating/cladding concentricity error	≤ 12 µm
Fiber curl (radius)	> 4 meters

* Aged in1% hydrogen at one atmosphere per IEC 60793-2-50 type B.1.3
**Complies with IEC 60794-3 Ed 3, section 5.5 method 1. PMD link design value provides a statistical upper limit for PMD over concatenated lengths. Individual PMD values may change when cabled.

Mechanical Specifications

Proof Test of AFC ColorLock Coated Fiber
The entire length is subjected to a tensile proof stress >100 kpsi (0.7 GN/m²); 1% strain equivalent

Tensile Strength
Dynamic tensile strength (0.5 meter gauge length):
Aged* and unaged median ≥ 550 kpsi (3.8 GN/m²)

Dynamic and Static Fatigue

Dynamic fatigue,	$N_d \geq 20$ unaged and aged*
Static fatigue	$N_s \geq 23$ aged at 85°C, 85% RH

Coating Performance
Coating strip force: 2.0 lbf (8.9 N) max, 0.2 lbf (1.3 N) min.
23°C, 0°C, and 45°C
Aged: 30 days at 85°C and 85% RH
14 days water immersion at 23°C
Wasp spray exposure (Telcordia)

Environmental Specifications

Induced attenuation@1550 nm	*(dB/km)*
Temperature cycling performance (–60°C to 85°C)	≤ 0.05
Temperature humidity cycling (–10°C to 85°C, 4–98% RH)	≤0.05
Water immersion (23°C, 14 days)	≤ 0.05
Heat aging (85°C, 30 days)	≤ 0.05
Damp heat (85°C, 85% RH, 30 days)	≤0.05

Typical Characterization Values

Nominal zero dispersion slope		0.085 ps/nm²*km
Effective group index	@ 1310 nm	1.467
	@ 1550 nm	1.468
	@ 1625 nm	1.468
Backscatter coefficient (1ns pulse width)	@ 1310 nm	–79.4 dB
	@ 1550 nm	–81.7 dB
	@ 1625 nm	–82.5 dB

Dynamic tensile strength
(*aged, 0.5 m gauge length) median 750 kpsi (5.26 GN/m²)

*Aged for 30 days at 85°C. 85% relative humidity

For Additional Information

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