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# Multimode Fibre





Yangtze Optical Fibre and Cable Joint Stock Limited Company (also known as “YOFC”) established in Wuhan, Hubei Province in May 1988, is a technologically innovative enterprise specializing in optical fibre preforms, optical fibres, optical fibre cables and integrated solutions, and also a global leading supplier in these areas.

YOFC was listed in the Hong Kong Stock Exchange on December 10, 2014 (Stock Code: 06869.HK), and listed on the Shanghai Stock Exchange on July 20, 2018 (Stock Code: 601869.SH), and is the only A&H shares company in China’s optical fibre and cable industry as well as the first one in Hubei Province.

YOFC mainly produces and sells different types of optical fibre preforms, optical fibres and optical fibre cables that widely installed in telecommunications industry, customized specialty optical fibres and optical fibre cables, RF coaxial cables and accessories. YOFC also provides the integrated systems, project design and services. In addition, YOFC is equipped with a full series of optical fibres, optical fibre cables and solutions, providing a variety of different products and solutions for world’s telecommunications industry and other industries (e.g. Public utility, Transportation, Oil & Chemistry and Medication etc.) and offering its products and services to over 70 countries and regions around the world.

Through introduction, digestion, absorption and re-innovation since its establishment, YOFC has carried out a way to successfully revitalize national industry. YOFC has mastered 3 types of optical fibre preform manufacturing technology (PCVD/OVD/VAD), and honored many awards & reputations such as National Enterprise Technical Center, National First Batch Intelligent Manufacturing Pilot Enterprise, the Second Class National Science and Technology Progress Award (3 times), the China Quality Award, the European Quality Award, etc. In addition, YOFC has obtained over 400 national-granted patents and several foreign invention patents from Europe, US and Japan, and was nominated the support organization for State Key Laboratory in optical fibre and optical fibre cable manufaction technology. It’s also one of the significant members in ITU-T and IEC in setting international standards.

Adhering to the mission of ‘Smart Link Better Life’, YOFC devotes itself to becoming the leader in information transmission and smart links through its core value ‘Client Focus Accountability Innovation Stakeholder Benefits’, and builds its strategies in the following 5 aspects: Organic growth strategy of the preform, optical fibre and cable business; Strategy for technological innovation and smart manufacturing; Strategy for internationalization and expansion of business scope; Related diversification strategy; Capital operation strategy for synergy in development.

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# OM1(62.5/125 $\mu$ m) Multimode Fibre

Yangtze Optical Fibre and Cable Joint Stock Limited Company

YOFC OM1(62.5/125 $\mu$ m) Multimode Fibre complies with or exceeds ISO/IEC 11801-1 OM1 specification, IEC 60793-2-10 A1-OM1 specification, and TIA-492AAAF A1-OM1 specification.

Features	Benefits and Applications
<ul style="list-style-type: none"> <li>Superior geometry uniformity</li> <li>Low attenuation</li> <li>High bandwidth at wavelengths of 850nm and 1300nm</li> <li>Manufactured by PCVD process</li> <li>Extremely refined refractive index profile</li> </ul>	<ul style="list-style-type: none"> <li>Local area networks (LAN)</li> <li>Video, voice and data services</li> <li>Gigabit Ethernet using laser or LED light sources</li> </ul>
<ul style="list-style-type: none"> <li>Coated with YOFC's proprietary dual layer UV curable acrylate</li> </ul>	<ul style="list-style-type: none"> <li>High resistance to micro-bending</li> <li>Optimized performance in tight-buffer cable applications</li> <li>Stable performance over a wide range of environmental conditions</li> </ul>

Characteristics	Conditions	Specified values	Units
<b>Geometry Characteristics</b>			
Core Diameter	--	62.5 $\pm$ 2.5	[ $\mu$ m]
Core Non-Circularity	--	$\leq$ 5.0	[%]
Cladding Diameter	--	125.0 $\pm$ 1.0	[ $\mu$ m]
Cladding Non-Circularity	--	$\leq$ 1.0	[%]
Coating Diameter	--	245 $\pm$ 7	[ $\mu$ m]
Coating/Cladding Concentricity Error	--	$\leq$ 10.0	[ $\mu$ m]
Coating Non-Circularity	--	$\leq$ 6.0	[%]
Core/Cladding Concentricity Error	--	$\leq$ 1.5	[ $\mu$ m]
Delivery Length	--	up to 17.6	[km/reel]
<b>Optical Characteristics</b>			
Attenuation	850nm	$\leq$ 2.7	[dB/km]
	1300nm	$\leq$ 0.6	[dB/km]
Overfilled Modal Bandwidth	850nm	$\geq$ 200	[MHz·km]
	1300nm	$\geq$ 500	[MHz·km]
Numerical Aperture	--	0.275 $\pm$ 0.015	--
Group Refractive Index	850nm	1.496	--
	1300nm	1.491	--
Zero Dispersion Wavelength, $\lambda_0$	--	1320~1365	[nm]
Zero Dispersion Slope, $S_0$	1320nm $\leq \lambda_0 \leq$ 1348nm	$\leq$ 0.11	[ps/(nm <sup>2</sup> ·km)]
	1348nm $\leq \lambda_0 \leq$ 1365nm	$\leq$ 0.001(1458- $\lambda_0$ )	[ps/(nm <sup>2</sup> ·km)]
Macrobending Loss	--	--	--
100 Turns @ 37.5 mm Radius	850nm	$\leq$ 0.50	[dB]
	1300nm	$\leq$ 0.50	[dB]
<b>Backscatter Characteristics 1300nm</b>			
Step (Mean of Bidirectional Measurement)	--	$\leq$ 0.10	[dB]
Irregularities Over Fibre Length and Point Discontinuity	--	$\leq$ 0.10	[dB]
Attenuation Uniformity	--	$\leq$ 0.10	[dB/km]
<b>Environmental Characteristics 850nm &amp; 1300nm</b>			
Temperature Cycling	-60°C to 85°C	$\leq$ 0.10	[dB/km]
Temperature-Humidity Cycling	-10°C to 85°C, 4% to 98% RH	$\leq$ 0.10	[dB/km]
Water Immersion	23°C, 30 days	$\leq$ 0.10	[dB/km]
Dry Heat	85°C, 30 days	$\leq$ 0.10	[dB/km]
Damp Heat	85°C, 85% RH, 30 days	$\leq$ 0.10	[dB/km]
<b>Mechanical Specification</b>			
Proof Test	--	$\geq$ 9.0	[N]
	--	$\geq$ 1.0	[%]
	--	$\geq$ 100	[kpsi]
Coating Strip Force	typical average force	1.5	[N]
	peak force	$\geq$ 1.3, $\leq$ 8.9	[N]
Dynamic Stress Corrosion Susceptibility Parameter ( $n_p$ , typical)	--	20	--



# OM2(50/125 $\mu$ m) Bend Insensitive Multimode Fibre

Yangtze Optical Fibre and Cable Joint Stock Limited Company

YOFC OM2(50/125 $\mu$ m) Bend Insensitive Multimode Fibre complies with or exceeds ISO/IEC 11801-1 OM2 specification, IEC 60793-2-10 A1-OM2 specification, and TIA-492AAAF A1-OM2 specification.

Features	Benefits and Applications
<ul style="list-style-type: none"> <li>Superior geometry uniformity</li> <li>Low attenuation</li> <li>High bandwidth at wavelengths of 850nm and 1300nm</li> <li>Manufactured by PCVD process</li> <li>Extremely refined refractive index profile</li> </ul>	<ul style="list-style-type: none"> <li>Local area networks (LAN)</li> <li>Video, voice and data services</li> <li>Gigabit Ethernet using laser or LED light sources</li> </ul>
<ul style="list-style-type: none"> <li>Very low macro-bending sensitivity</li> </ul>	<ul style="list-style-type: none"> <li>Supports the use and installation of optical cables with a small bending radius</li> </ul>
<ul style="list-style-type: none"> <li>Coated with YOFC's proprietary dual layer UV curable acrylate</li> </ul>	<ul style="list-style-type: none"> <li>High resistance to micro-bending</li> <li>Optimized performance in tight-buffer cable applications</li> <li>Stable performance over a wide range of environmental conditions</li> </ul>

Characteristics	Conditions	Specified values	Units
<b>Geometry Characteristics</b>			
Core Diameter	--	50 $\pm$ 2.5	[ $\mu$ m]
Core Non-Circularity	--	$\leq$ 5.0	[%]
Cladding Diameter	--	125.0 $\pm$ 1.0	[ $\mu$ m]
Cladding Non-Circularity	--	$\leq$ 1.0	[%]
Coating Diameter	--	245 $\pm$ 7	[ $\mu$ m]
Coating/Cladding Concentricity Error	--	$\leq$ 10.0	[ $\mu$ m]
Coating Non-Circularity	--	$\leq$ 6.0	[%]
Core/Cladding Concentricity Error	--	$\leq$ 1.5	[ $\mu$ m]
Delivery Length	--	up to 17.6	[km/reel]
<b>Optical Characteristics</b>			
Attenuation	850nm	$\leq$ 2.3	[dB/km]
	1300nm	$\leq$ 0.6	[dB/km]
Overfilled Modal Bandwidth	850nm	$\geq$ 500	[MHz·km]
	1300nm	$\geq$ 500	[MHz·km]
Numerical Aperture	--	0.200 $\pm$ 0.015	--
Group Refractive Index	850nm	1.482	--
	1300nm	1.477	--
Zero Dispersion Wavelength, $\lambda_0$	--	1295-1340	[nm]
Zero Dispersion Slope, $S_0$	1295nm $\leq\lambda_0\leq$ 1310nm	$\leq$ 0.105	[ps/(nm <sup>2</sup> ·km)]
	1310nm $\leq\lambda_0\leq$ 1340nm	$\leq$ 0.000375 (1590- $\lambda_0$ )	[ps/(nm <sup>2</sup> ·km)]
Macrobending Loss	--	--	--
2 Turns @ 15 mm Radius	850nm	$\leq$ 0.1	[dB]
	1300nm	$\leq$ 0.3	[dB]
2 Turns @ 7.5 mm Radius	850nm	$\leq$ 0.2	[dB]
	1300nm	$\leq$ 0.5	[dB]
<b>Backscatter Characteristics</b>			
<b>1300nm</b>			
Step (Mean of Bidirectional Measurement)	--	$\leq$ 0.10	[dB]
Irregularities Over Fibre Length and Point Discontinuity	--	$\leq$ 0.10	[dB]
Attenuation Uniformity	--	$\leq$ 0.08	[dB/km]
<b>Environmental Characteristics</b>			
<b>850nm &amp; 1300nm</b>			
Temperature Cycling	-60°C to 85°C	$\leq$ 0.10	[dB/km]
Temperature-Humidity Cycling	-10°C to 85°C, 4% to 98% RH	$\leq$ 0.10	[dB/km]
Water Immersion	23°C, 30 days	$\leq$ 0.10	[dB/km]
Dry Heat	85°C, 30 days	$\leq$ 0.10	[dB/km]
Damp Heat	85°C, 85% RH, 30 days	$\leq$ 0.10	[dB/km]
<b>Mechanical Specification</b>			
Proof Test	--	$\geq$ 9.0	[N]
	--	$\geq$ 1.0	[%]
	--	$\geq$ 100	[kpsi]
Coating Strip Force	typical average force	1.5	[N]
	peak force	$\geq$ 1.3, $\leq$ 8.9	[N]
Dynamic Stress Corrosion Susceptibility Parameter ( $n_p$ , typical)	--	20	--

# MaxBand® OM2+/OM3/OM4 Bend Insensitive Multimode Fibre

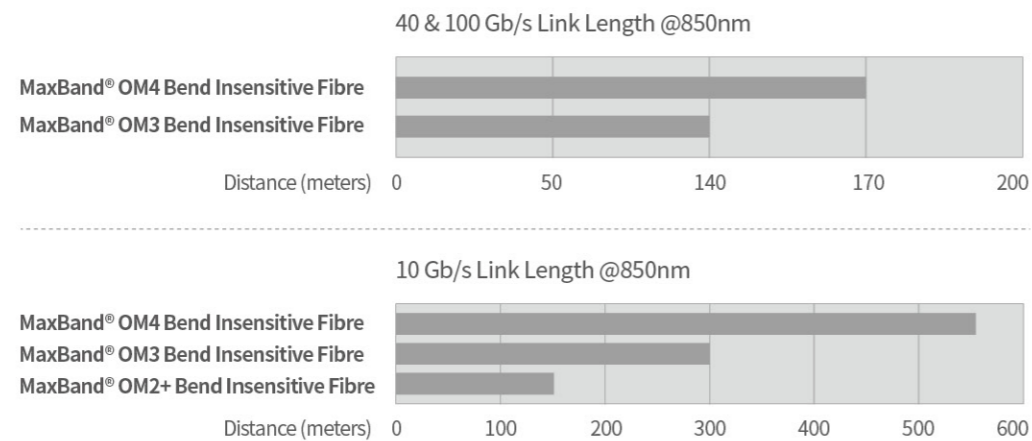
Yangtze Optical Fibre and Cable Joint Stock Limited Company

YOFC MaxBand® OM2+ Bend Insensitive Multimode Fibre complies with or exceeds ISO/IEC 11801-1 OM2 specification, IEC 60793-2-10 A1-OM2 specification, and TIA-492AAAF A1-OM2 specification.

YOFC MaxBand® OM3/OM4 Bend Insensitive Multimode Fibres comply with or exceed ISO/IEC 11801-1 OM3/OM4 specifications, IEC 60793-2-10 A1-OM3/A1-OM4 specifications, and TIA-492AAAF A1-OM3/A1-OM4 specifications.

Features	Benefits and Applications
<ul style="list-style-type: none"> <li>Optimized for 850nm VCSEL</li> <li>Compatibility with current OM2+/OM3/OM4 multimode fibre</li> <li>Superior geometry uniformity</li> <li>Low attenuation</li> <li>High bandwidth</li> <li>Low differential mode delay (DMD)</li> </ul>	<ul style="list-style-type: none"> <li>Data centers</li> <li>Data storage networks</li> <li>High-performance computing centers</li> <li>Office centers</li> <li>Local area networks (LAN)</li> <li>1 &amp; 10 &amp; 40 &amp; 100 &amp; 400 Gb/s Ethernet</li> </ul>
<ul style="list-style-type: none"> <li>Very low macro-bending sensitivity</li> </ul>	<ul style="list-style-type: none"> <li>Supports the use and installation of optical cables with a small bending radius</li> </ul>
<ul style="list-style-type: none"> <li>Coated with YOFC's proprietary dual layer UV curable acrylate</li> </ul>	<ul style="list-style-type: none"> <li>High resistance to micro-bending</li> <li>Optimized performance in tight-buffer cable applications</li> <li>Stable performance over a wide range of environmental conditions</li> </ul>

## System Link Length



Characteristics	Conditions	Specified values	Units
<b>Geometry Characteristics</b>			
Core Diameter	--	50±2.5	[µm]
Core Non-Circularity	--	≤5.0	[%]
Cladding Diameter	--	125.0±1.0	[µm]
Cladding Non-Circularity	--	≤0.6	[%]
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]
<b>Optical Characteristics</b>			
Attenuation	850nm	≤2.4	[dB/km]
	1300nm	≤0.6	[dB/km]
--	--	MaxBand® OM2+/OM3/OM4 Bend Insensitive	
Overfilled Modal Bandwidth	850nm	≥700/≥1500/≥3500	[MHz·km]
	1300nm	≥500/≥500/≥500	[MHz·km]
Effective Modal Bandwidth	850nm	≥950/≥2000/≥4700	[MHz·km]
Application support distance on	--	--	--
40GBASE-SR4 / 100GBASE-SR10 <sup>1</sup>	850nm	-/140/170	[m]
10GBASE-SR	850nm	150/300/550	[m]
1000BASE-SR	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	1.482	--
	1300nm	1.477	--
Zero Dispersion Wavelength, λ <sub>0</sub>	--	1295-1340	[nm]
Zero Dispersion Slope, S <sub>0</sub>	1295nm ≤ λ <sub>0</sub> ≤ 1310nm	≤0.105	[ps/(nm <sup>2</sup> ·km)]
	1310nm ≤ λ <sub>0</sub> ≤ 1340nm	≤0.000375(1590-λ <sub>0</sub> )	[ps/(nm <sup>2</sup> ·km)]
Macrobending Loss <sup>2</sup>	--	--	--
2 Turns @ 15 mm Radius	850nm	≤0.1	[dB]
	1300nm	≤0.3	[dB]
2 Turns @ 7.5 mm Radius	850nm	≤0.2	[dB]
	1300nm	≤0.5	[dB]
<b>Backscatter Characteristics</b>			
<b>1300nm</b>			
Step (Mean of Bidirectional Measurement)	--	≤0.10	[dB]
Irregularities Over Fibre Length and Point Discontinuity	--	≤0.10	[dB]
Attenuation Uniformity	--	≤0.08	[dB/km]
<b>Environmental Characteristics</b>			
<b>850nm &amp; 1300nm</b>			
Temperature Cycling	-60°C to 85°C	≤0.10	[dB/km]
Temperature-Humidity Cycling	-10°C to 85°C, 4% to 98% RH	≤0.10	[dB/km]
Water Immersion	23°C, 30 days	≤0.10	[dB/km]
Dry Heat	85°C, 30 days	≤0.10	[dB/km]
Damp Heat	85°C, 85% RH, 30 days	≤0.10	[dB/km]
<b>Mechanical Specification</b>			
Proof Test	--	≥9.0	[N]
	--	≥1.0	[%]
	--	≥100	[kpsi]
Coating Strip Force	typical average force	1.5	[N]
	peak force	≥1.3, ≤8.9	[N]
Dynamic Stress Corrosion Susceptibility Parameter (n <sub>g</sub> , typical)	--	20	--

Remarks: 1. Support distances considering maximum cable attenuation of 3.0 dB/km at 850 nm, maximum total splice/connector loss of 1.0 dB and VCSELs maximum RMS spectral width ≤ 0.45 nm

2. The launch condition for the macrobending loss measurement fulfils that described in IEC 61280-4-1.

# MaxBand® WideBand OM5 Bend Insensitive Multimode Fibre

Yangtze Optical Fibre and Cable Joint Stock Limited Company

YOFC MaxBand® WideBand OM5 Bend Insensitive Multimode Fibre is a 50µm laser-optimized multimode fibre designed for short wavelength division multiplexing (SWDM) applications. Unlike legacy OM4 multimode fibre with high bandwidth at 850nm, YOFC MaxBand® OM5 Bend Insensitive Multimode Fibre has high bandwidth in the 850-950nm window and maintaining backward compatibility with legacy OM4 fibre. WideBand OM5 and multi-wavelength transceivers are a viable solution for 100Gb/s and 400Gb/s multi-wavelength systems.

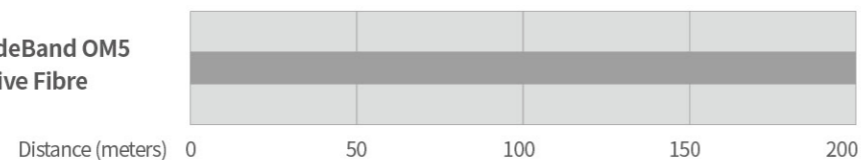
YOFC MaxBand® WideBand OM5 Bend Insensitive Multimode Fibre complies with or exceeds ISO/IEC 11801-4 OM5 specification, IEC 60793-2-10 A1-OM5 specification, and TIA-492AAAF A1-OM5 specification.

Features	Benefits and Applications
<ul style="list-style-type: none"> <li>Designed for multi-wavelength systems</li> <li>High bandwidth in the wavelength range of 850-950nm</li> <li>Backward compatibility with legacy OM4 fibre</li> </ul>	<ul style="list-style-type: none"> <li>Support single-wavelength and multi-wavelength transmission system from 40Gb/s to 400Gb/s</li> </ul>
<ul style="list-style-type: none"> <li>Superior geometry uniformity</li> <li>Low attenuation</li> <li>High bandwidth</li> <li>Low differential mode delay (DMD)</li> </ul>	<ul style="list-style-type: none"> <li>Data centers</li> <li>Office centers</li> <li>Data storage networks</li> <li>Local area networks (LAN)</li> <li>High-performance computing centers a</li> </ul>
<ul style="list-style-type: none"> <li>Very low macro-bending sensitivity</li> </ul>	<ul style="list-style-type: none"> <li>Supports the use and installation of optical cables with a small bending radius</li> </ul>
<ul style="list-style-type: none"> <li>Coated with YOFC's proprietary dual layer UV curable acrylate</li> </ul>	<ul style="list-style-type: none"> <li>High resistance to micro-bending</li> <li>Optimized performance in tight-buffer cable applications</li> <li>Stable performance over a wide range of environmental conditions</li> </ul>

## System Link Length

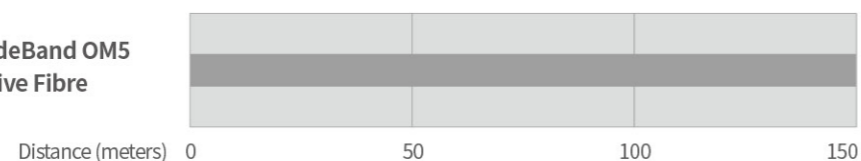
40 & 100 Gb/s Link Length @850nm

MaxBand® WideBand OM5  
Bend Insensitive Fibre



100Gb/s Link Length Based on WDM

MaxBand® WideBand OM5  
Bend Insensitive Fibre



Characteristics	Conditions	Specified values	Units
<b>Geometry Characteristics</b>			
Core Diameter	--	50±2.5	[µm]
Core Non-Circularity	--	≤5.0	[%]
Cladding Diameter	--	125.0±1.0	[µm]
Cladding Non-Circularity	--	≤0.6	[%]
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]
<b>Optical Characteristics</b>			
Attenuation	850nm	≤2.4	[dB/km]
	953nm	≤1.7	[dB/km]
	1300nm	≤0.6	[dB/km]
Overfilled Modal Bandwidth	850nm	≥3500	[MHz·km]
	953nm	≥1850	[MHz·km]
	1300nm	≥500	[MHz·km]
Effective Modal Bandwidth	850nm	≥4700	[MHz·km]
	953nm	≥2470	[MHz·km]
Application support distance on	--	--	--
100Gb/s WDM <sup>1</sup>	--	150	[m]
40Gb/s WDM <sup>1</sup>	--	440	[m]
40GBASE-SR4 / 100GBASE-SR10 <sup>2</sup>	850nm	200	[m]
Numerical Aperture	--	0.200±0.015	--
Group Refractive Index	850nm	1.482	--
	1300nm	1.477	--
Zero Dispersion Wavelength, λ <sub>0</sub>	--	1297-1328	[nm]
Zero Dispersion Slope, S <sub>0</sub>	--	≤4(-103) / (840(λ <sub>0</sub> /840) <sup>4</sup> )	[ps/(nm <sup>2</sup> ·km)]
Macrobending Loss <sup>3</sup>	--	@850nm	@1300nm
2 Turns @ 15 mm Radius	--	≤0.1	≤0.3
2 Turns @ 7.5 mm Radius	--	≤0.2	≤0.5
<b>Backscatter Characteristics</b>			
<b>850nm &amp; 1300nm</b>			
Step (Mean of Bidirectional Measurement)	--	≤0.10	[dB]
Irregularities Over Fibre Length and Point Discontinuity	--	≤0.10	[dB]
Attenuation Uniformity	--	≤0.08	[dB/km]
<b>Environmental Characteristics</b>			
<b>850nm &amp; 1300nm</b>			
Temperature Cycling	at -60°C to 85°C	≤0.10	[dB/km]
Temperature-Humidity Cycling	at -10°C to 85°C and 4% to 98% RH	≤0.10	[dB/km]
Water Immersion	at 23°C for 30 days	≤0.10	[dB/km]
Dry Heat	at 85°C for 30 days	≤0.10	[dB/km]
Damp Heat	at 85°C and 85% RH for 30 days	≤0.10	[dB/km]
<b>Mechanical Specification</b>			
Proof Test	--	≥9.0	[N]
	--	≥1.0	[%]
	--	≥100	[kpsi]
Coating Strip Force	typical average force	1.5	[N]
	peak force	≥1.3, ≤8.9	[N]
Dynamic Stress Corrosion Susceptibility Parameter (n <sub>g</sub> , typical)	--	20	--

Remarks:1. Support distance with SWDM transceivers <http://www.swdm.org/msa/>

2. Support distances considering maximum cable attenuation of 3.0 dB/km at 850 nm, maximum total splice/connector loss of 1.0 dB and VCSELs maximum RMS spectral width ≤ 0.45 nm

3. The launch condition for the macrobending loss measurement fulfils that described in IEC 61280-4-1.