

4. Cable Structure Parameters

Item	Content	Unit	Value							
			1	2	4	8	12	16	20	24
Fiber count	Number	/	1	2	4	8	12	16	20	24
Fiber count per tube	Number	/	1	2	4	8	12	12/4	12/8	12
Loose tube	Number	/	1	1	1	1	1	2	2	2
Filler rod	Number	/	4	4	4	4	4	3	3	3
Central strength member	Material	/	FRP							
Armor	Material	/	Corrugated steel tape							
Peripheral strength member	Material	/	Two parallel steel wires							
Outer sheath	Material	/	HDPE							
	Color	/	Black							
Cable diameter	±5%	mm	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8
Cable weight	±10%	kg/km	109	109	109	109	109	109	109	109

Item	Content	Unit	Value						
			36	48	60	72	96	144	288
Fiber count	Number	/	36	48	60	72	96	144	288
Fiber count per tube	Number	/	12	12	12	12	12	12	12
Loose tube	Number	/	3	4	5	6	8	12	9+15
Filler rod	Number	/	2	1	0	0	0	0	0
Central strength member	Material	/	FRP (with cushion if needed)						
Armor	Material	/	Corrugated steel tape						
Peripheral strength member	Material	/	Two parallel steel wires						
Outer sheath	Material	/	HDPE						
	Color	/	Black						
Cable diameter	±5%	mm	10.8	10.8	10.8	11.4	12.6	15.1	17.0
Cable weight	±10%	kg/km	109	109	109	125	149	201	260

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5. Optical Fiber & Cable Performance

5.1 Optical Fiber Performance

ITU-T G.652.D Characteristics

Item	Contents	Value
Attenuation	@ 1310nm	$\leq 0.36\text{dB/km}$
	@ 1550nm	$\leq 0.22\text{dB/km}$
Dispersion	@ 1310nm	$\leq 3.5\text{ps}/(\text{nm}\cdot\text{km})$
	@ 1550nm	$\leq 18\text{ps}/(\text{nm}\cdot\text{km})$
	@ 1625nm	$\leq 22\text{ps}/(\text{nm}\cdot\text{km})$
Zero-Dispersion wavelength		1300nm~1324nm
Zero-Dispersion slope		$\leq 0.092\text{ps}/(\text{nm}^2\cdot\text{km})$
Mode field diameter(MFD)	@ 1310nm	$9.2\pm 0.4\mu\text{m}$
	@ 1550nm	$10.4\pm 0.8\mu\text{m}$
Cable cutoff wavelength $\lambda_{cc}(\text{nm})$		$\leq 1260\text{nm}$
Micro-bending Attenuation	@ 1550nm (1turns, $\Phi 32\text{mm}$)	$\leq 0.05\text{dB}$
	@ 1625nm (1turns, $\Phi 32\text{mm}$)	$\leq 0.05\text{dB}$
	@ 1550nm (100turns, $\Phi 60\text{mm}$)	$\leq 0.05\text{dB}$
	@ 1625nm (100turns, $\Phi 60\text{mm}$)	$\leq 0.05\text{dB}$
Link polarization dispersion (PMD ₀)		$\leq 0.1\text{ps}/\text{km}^{1/2}$
Geometrical characteristics		
Cladding diameter		$125\pm 1.0\mu\text{m}$
Cladding non-circularity		$\leq 1\%$
Core/cladding concentricity error		$\leq 0.6\mu\text{m}$
Fiber diameter with coating (uncoated)		$242\pm 7\mu\text{m}$
Mechanical characteristics		
Proof stress		$\geq 0.69\text{GPa}$
Coating strip force		1.0~8.9N
Environmental characteristics		
Temperature induced attenuation(-60~+85℃)		$\leq 0.05\text{dB/km}$
Dry heat induced attenuation (85℃±2℃, 30 days)		$\leq 0.05\text{dB/km}$
Water immersion induced attenuation (23℃±2℃, 30 days)		$\leq 0.05\text{dB/km}$
Damp heat induced attenuation (85℃±2℃, RH85%, 30 days)		$\leq 0.05\text{dB/km}$

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5.2 Optical Fiber Cable Performance

Item	Contents	Unit	Value
Max. tensile load	Short term	N	3000
Max. crush resistance	Short term	N/100mm	3000
Min. bending radius	Installation	mm	20 x cable diameter
	Operation	mm	15 x cable diameter
Temperature range	Operation	°C	-20 ~ +70
	Installation	°C	-10 ~ +70
	Storage/transportation	°C	-20 ~ +70

6. Test Requirements

6.1 Optical Fiber Test

Item	Test method
Optical characteristics	
Mode field diameter	IEC 60793-1-45
Attenuation	IEC 60793-1-40
Cut-off wavelength	IEC 60793-1-44
Bending loss	IEC 60793-1-47
Chromatic dispersion	IEC 60793-1-42
PMD	IEC 60793-1-48
Geometrical characteristics	
Core diameter	IEC 60793-1-20
Cladding diameter	IEC 60793-1-20
Coating diameter	IEC 60793-1-20
Cladding non-circularity	IEC 60793-1-20
Core/cladding concentricity error	IEC 60793-1-20
Cladding/coating concentricity error	IEC 60793-1-20
Mechanical characteristics	
Proof test	IEC 60793-1-30
Fiber curl	IEC 60793-1-34
Coating strip force	IEC 60793-1-32
Environmental characteristics	
Temperature induced attenuation	IEC 60793-1-52
Dry heat induced attenuation	IEC 60793-1-51
Water immersion induced attenuation	IEC 60793-1-53
Damp heat induced attenuation	IEC 60793-1-50

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6.2 Optical Fiber Cable Test

Item	Test Method	Acceptance Condition
Tensile Strength IEC 60794-1-2-E1	- Load: Short term tensile - Length of cable: about 50m - Load time: 10min	- Attenuation change $\leq 0.1\text{dB}@1550\text{nm}$ after test. - No fiber break and no sheath damage.
Crush Test IEC 60794-1-2-E3	- Load: Short term crush - Load time: 10min	- Attenuation change $\leq 0.1\text{dB}@1550\text{nm}$ after test. - No fiber break and no sheath damage.
Impact Test IEC 60794-1-2-E4	- Points of impact: 3 - Times of per point: 1 - Load: 2kg - Height: 1m	- Attenuation change $\leq 0.1\text{dB}@1550\text{nm}$ after test. - No fiber break and no sheath damage.
Torsion IEC 60794-1-2-E7	- Length: 2m - Twist angle: $\pm 180^\circ$ - No. of cycle: 5	- Attenuation change $\leq 0.1\text{dB}@1550\text{nm}$ after test. - No fiber break and no sheath damage.
Cable bend IEC 60794-1-2-E11	- Diameter of mandrel: 20 x OD - Number of turns: 5 - Number of cycles: 2	- Attenuation change $\leq 0.1\text{dB}@1550\text{nm}$ after test. - No fiber break and no sheath damage.
Temperature Cycling IEC 60794-1-2-F1	- Temperature: $-20^\circ\text{C}\sim+70^\circ\text{C}$ - Time of each step: 12h - Number of cycle: 2	- Attenuation change $\leq 0.1\text{dB}@1550\text{nm}$ after test. - No fiber break and no sheath damage.
Water Penetration IEC 60794-1-2-F5B	- Height of water: 1m - Sample length: 3m - Time: 24h	- No water leak from the cable core of the opposite end.

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