

AD-FO-SM-X-G652D : ARMORED FIBRE Optic Cable Single mode G652D Low loss

GENERAL

SCOPE

This listed specification covers the design requirements and performance standard for the supply of optical fiber cable in the industry. It also includes ADTRONICS premium designed cable with optical, mechanical and geometrical characteristics

Cable Description

cable possesses high tensile strength and flexibility in compact cable sizes. At the same time, it provides excellent optical transmission and physical performance.

Quality

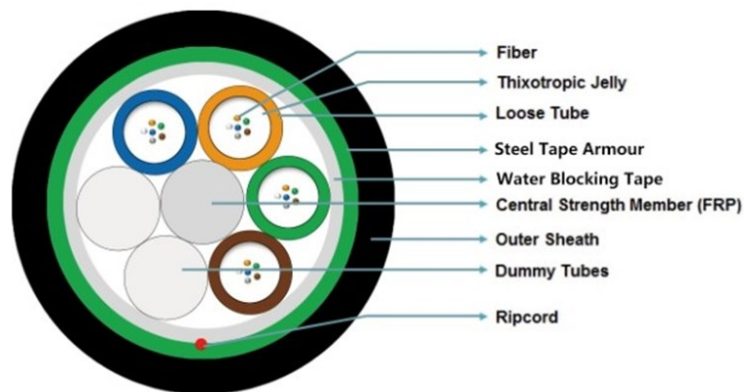
ADTRONICS ensures a continuing level of quality in our cable products through several quality control programs including ISO 9001.

Reliability

Both initial and periodic qualification testing are performed to assure the cable's performance and durability in the field environments. .

The cable are designed, manufactured and tested according to international standards as follow

Reference	Description
AD-FO-SM-06-G652D	ADTRONICS ARMORED FIBRE OPTIC CABLE SINGLE MODE 06 core G652D
AD-FO-SM-12-G652D	ADTRONICS ARMORED FIBRE OPTIC CABLE SINGLE MODE 12 core G652D
AD-FO-SM-24-G652D	ADTRONICS ARMORED FIBRE OPTIC CABLE SINGLE MODE 24 core G652D
AD-FO-SM-48-G652D	ADTRONICS ARMORED FIBRE OPTIC CABLE SINGLE MODE 48 core G652D
AD-FO-SM-72-G652D	ADTRONICS ARMORED FIBRE OPTIC CABLE SINGLE MODE 72 core G652D



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Optics Specifications		
Attenuation(dB/km)	@1310nm db/km	After cabling ≤ 0.34 dB/km
	@1383nm (after hydrogen aging)	≤ 0.32 db/km
	@1550nm db/km	After cabling ≤ 0.20 dB/km
	@1625nm	≤ 0.24 db/km
Dispersion	@1285nm~1340nm	≤ 2.8 ps/(nm*km)
	@1550nm	≤ 17 ps/(nm*km)
	@1625nm	≤ 22 ps/(nm*km)
Zero-Dispersion wavelength		1300~1324nm
Zero-Dispersion slope		≤ 0.092 ps/(nm ² *km)
Mode field diameter @ 1310nm		9.2±0.4μm
Mode field diameter @ 1550nm		10.4±0.8μm
PMD	Max. value for fiber on the reel	0.2ps/km 1/2
	Max. Designed value for link	0.08ps/km 1/2
Cable cutoff wavelength,λ cc		≤ 1260 nm
Effective group index(Neff)@1310nm		1.4675
Effective group index(Neff)@1550nm		1.4680
Macro-bend loss(Φ60mm,100 turns)@1550nm		≤ 0.05 db
Back scatter characteristic(@1310nm&1550nm)		
Point discontinuity		≤ 0.05 db
Attenuation uniformity		≤ 0.05 db/km
Attenuation coefficient difference for bi-directional measurement		≤ 0.05 db/km
Geometrical characteristics		
Cladding diameter		125±1μm
Cladding non-circularity		$\leq 1\%$
Core/cladding concentricity error		≤ 0.4 μm
Fiber diameter with coating(uncolored)		245±5μm
Cladding/coating concentricity error		≤ 12.0 μm
Curl		≥ 4 m

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Mechanical characteristic	
Proof test	0.69GPa
Coating strip force(typical value)	1.4N
Dynamic stress corrosion susceptibility parameter(typical value)	≥20
Environmental characteristics(@1310nm&1550nm)	
Temperature induced attenuation(-60~+85℃)	≤0.5dB/km
Dry heat induced attenuation(85±2℃,30days)	≤0.5dB/km
Water immersion induced attenuation(23±2℃,30days)	≤0.5dB/km
Damp heat induced attenuation(85±2℃,RH85%,30days)	≤0.5dB/km

Fiber optic	Type	Single mode G652D Low loss
	Number	6/72core
Number of loose tube		1/6
Number of dummy tube (filler)		5/0
Loose tube	Material	PBTP
	Diameter	1.9mm ±0.05
Central strength member	Material	FRP
	Diameter	1.5mm
Core wrapping	Material	Water swellable tape
Armored teal tape	Material	Corrugated steel tape
	Thickness	0.21mm
Outer sheath	Material	HDPE
	Thickness	1.6mm
Ripcord		2PCS under outersheath
Diameter of cable		9.4±0.2
Weight of cable (kg/km)		84±5
Lifetime		≥ 30 years
Tensile Strength		≥ 2000N
Crush Strength		2200N/100MM

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The fibres shall be marked by a coloured coating with 12 different colours according to EIA/TIA 598:

1 # Blue	2# orange	3#Green	4# Brown	5# Grey	6#White
7# Red	8#Black	9#Yellow	10 # Violet	11#Pink	12#Aqua

COLOR IDENTIFICATION OF LOOSE TUBE

1 # Blue	2# orange	3#Green	4# Brown	5# Grey	6#White
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TEST REQUIREMENTS

The cable is in accordance with applicable standard of cable and requirement of customer. The following test items are carried out according to corresponding reference.

Routine tests of optical fiber

<i>Mode field diameter</i>	<i>IEC 60793-1-45</i>
<i>Mode field Core/clad concentricity</i>	<i>IEC 60793-1-20</i>
<i>Cladding diameter</i>	<i>IEC 60793-1-20</i>
<i>Cladding non-circularity</i>	<i>IEC 60793-1-20</i>
<i>Attenuation coefficient</i>	<i>IEC 60793-1-40</i>
<i>Chromatic dispersion</i>	<i>IEC 60793-1-42</i>
<i>Cable cut-off wavelength</i>	<i>IEC 60793-1-44</i>

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TEST FOR OUTDOOR CABLE

Tension Loading Test

Test Standard	IEC 60794-1-2 E1
Sample length	No less than 50 meters
Load	Max. installation load
Duration time	1 hour
Test results	Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements

Crush/Compression Test

Test Standard	IEC 60794-1-2 E3
Load	Crush load
Plate size	100mm length
Duration time	1 minute
Test number	1
Test results	Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements

Impact Resistance Test

Test Standard	IEC 60794-1-2 E4
Impact energy	6.5J
Radius	13.6mm
Impact points	3
Impact number	2
Test result	Additional attenuation: $\leq 0.05\text{dB}$

Repeated Bending Test

Test Standard	IEC 60794-1-2 E6
Bending radius	20 X diameter of cable
Cycles	25 cycles
Test result	Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements

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Torsion/Twist Test

Test Standard	IEC 60794-1-2 E7
Sample length	2m
Angles	±180 degree
cycles	10
Test result	Additional attenuation:≤0.05dB No damage to outer jacket and inner elements

Bend Test

Test Standard	IEC 60794-1-2 E11B
Mandrel diameter	20 X diameter of cable
Turn number	4
Number of cycles	3
Temperature	20°C
Test result	No damage to outer jacket and inner elements

Temperature cycling Test

Test Standard	IEC 60794-1-2 F1
Temperature step	+20°C →-40°C →+85°C→+20°C
Time per each step	Transition from 0 °C to -40 °C :2hours; duration at -40 °C :8 hours; Transition from -40 °C to +85 °C :4hours; duration at +85 °C :8 hours; Transition from +85 °C to 0°C:2hours
Cycles	5
Test result	Attenuation variation for reference value (the attenuation to be measured before test at +20±3°C) ≤ 0.05 dB/km

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Water penetration Test

Test Standard	IEC 60794-1-2 F5
Height of water column	1m
Sample length	1m
Test time	1 hour
Test result	No water leakage from the opposite of the sample

Drip Test

Test Standard	IEC 60794-1-2 E14
Sample length	0.3m
Temperature	70 °C
Duration	24 hrs
Test result	No filling compound shall drip from tubes

PACKING AND DRUM

T cables are packed in carton, coiled on Bakelite & wooden drum. During transportation, right tools should be used to avoid damaging the package and to handle with ease. Cables should be protected from moisture; kept away from high temperature and fire sparks; protected from over bending and crushing; protected from mechanical stress and damage.

Packing length :2000-4000m/reel.

