Technical Specifications:
Self Supporting Aerial Installation Cable
(According to ITU-T G.652)

Part Numbers:
12 Count Fiber: MADSS012SM-350
24 Count Fiber: MADSS024SM-350
48 Count Fiber: MADSS048SM-350

1. GENERAL

1.1 SCOPE

This specification covers the design requirements and performance standard for Multicom's optical fiber cable.

Cable type	Application
ADSS	Self support aerial installation cable

1.2 Cable Description

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

1.3 Quality

Excellent quality control is achieved through rigorous in-house quality control and assurance by ISO 9001 process control technology.

1.4 Reliability

Initial and ongoing product qualification tests for performance and durability are performed to ensure product reliability.

1.5 Reference

Multicom's cable is designed, manufactured and tested according to the international standards as follows:

IEC 60793-1	Optical fiber Part 1: Generic specifications
IEC 60793-2	Optical fiber Part 2: Product specifications
IEC 60794-4	Optical fiber cables-Part 4: Sectional specification-Aerial optical cables along electrical power lines
EIA/TIA 598 B	Color code of fiber optic cables
ITU-T G.650	Definition and test methods for the relevant parameters of single-mode fibers
ITU-T G.652	Characteristics of a single-mode optical fiber cable
ITU-T G.655	Characteristics of a non-zero dispersion-shifted single-mode optical fiber and cable

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2. OPTICAL FIBER

- The optical fiber is made of high-purity germanium-doped silica. UV curable acrylate material is applied over the fiber cladding as a protective coating. The detailed data of optical fiber performance is shown in the following table.
- ITU/T G.652 optical fiber uses special manufacturing equipement to successfully control the value of PMD to ensure stability during cabling.

G.652D Fiber in cable

Category	Description	Specifications	
		Before cabling	After cabling
Optical Specifications	Attenuation @1310 nm	≤0.34 dB/km	≤0.36 dB/km
	Attenuation @1383 nm	≤0.34 dB/km	≤0.35 dB/km
	Attenuation @1550 nm	≤0.20 dB/km	≤0.22 dB/km
	Attenuation @1625 nm	≤0.23dB/km	≤0.25 dB/km
	Zero Dispersion Wavelength	1300~1324 nm	
	Zero Dispersion Slope	≤ 0.092 ps/nm^2·km	
	PMD Link value (M=20cables Q=0.01%) maximum PMD_Q	0.2 ps/√km	
	Cable Cutoff Wavelength (λ_{cc})	≤1260 nm	
	Macro bending Loss (100 turns; Φ50 mm) @1550 nm (100 turns; Φ50 mm) @1625 nm	≤ 0.05 dB ≤ 0.10 dB	
	Mode Field Diameter @1310 nm	9.2±0.4μm	
Dimensional Specifications	Cladding Diameter	125 ±1μm	
	Core/clad concentricity error	≤0.6μm	
	Cladding Non-Circularity	≤1.0%	
Mechanical Specifications	Proof stress	≥0.69Gpa	

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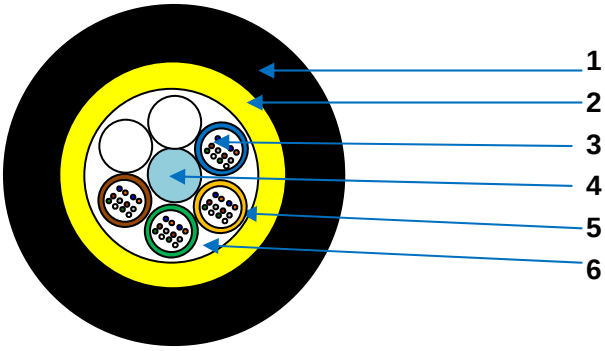
3. CABLE STRUCTURE

3.1 Cable Type: ADSS



Construction:

1. PE outer sheath
2. Strength member (Aramid yarns)
3. Fiber and jelly
4. Central strength member (FRP)
5. Loose tube
6. Cable jelly

Dimension and Properties

Physical	Fiber count	12	24	48
	Fiber No. per tube	6	6	8
	Cable OD	9.9 mm	9.9 mm	9.9mm
	Cable weight	Approx. 98kg/km		
	Operation temperature range	-40 deg C to + 70 deg C		
	Installation temperature range	-10 deg C to + 60 deg C		
	Transport and storage temperature range	-40 deg C to + 70 deg C		
Mechanical	Max. allowable pulling force	2000N		
	Crush resistance	1000 N/10cm		
	Minimal installation bending radius	20 x OD		
	Minimal operation bending radius	10 x OD		

Color code scheme: According to EIA/TIA 598 C

Fiber color	blue	orange	green	brown	gray	white	red	black	/	/	/	/
Tube color	blue	orange	green	brown	gray	white	/	/	/	/	/	/

Note: 1. the nominal outer diameter may vary by ± 5%. 2. The nominal cable weight may vary by ±10%.

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4. TEST REQUIREMENTS

The following test items are carried out according to the corresponding references:

Routine tests of optical fiber

Mode field diameter	IEC 60793-1-45
Mode field Core/clad concentricity	IEC 60793-1-20
Cladding diameter	IEC 60793-1-20
Cladding non-circularity	IEC 60793-1-20
Coating Diameter	IEC 60793-1-21
Attenuation coefficient	IEC 60793-1-40
Chromatic dispersion	IEC 60793-1-42
Cable cut-off wavelength	IEC 60793-1-44

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Outdoor cable testing:

4.1 Tension	IEC 60794-1-E1
Sample length	No less than 50 meters
Load	Max. allowable pulling force
Test results	10 minutes Fiber strain:≤0.6% Additional attenuation:≤0.1dB No damage to outer jacket and inner elements

4.2 Crush	IEC 60794-1-E3
Plate size	100mm length
Load	Short crush resistance
Duration time	5 minutes
Test number	3
Test results	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements

4.3 Impact	IEC 60794-1-E4
Impact energy	3J
Radius	12.5mm
Impact points	3
Impact number	1
Test result	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements

4.4 Repeated bending	IEC 60794-1-E6
Sample length	1m
Bending radius	20*D
Cycles	30
Test result	Additional attenuation: ≤0.1dB

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4.5 Torsion	**IEC 60794-1-E7**
Sample length	2m
Angles	±180 degree
cycles	5
Load	150N
Test result	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements

4.6 Bending	**IEC 60794-1-E11**
Mandrel diameter	20*D
Turn number	4
Cycles	3
Temperature	20 ^{o}C
Test result	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements

4.7 Temperature cycling	**IEC 60794-1-F1**
Temperature step	+20°C →-40°C →+70°C →-40°C →+70°C →+20°C
Time per each step	12 hrs
Cycles	2
Test result	Attenuation variation for reference value (the attenuation to be measured before test at +20±3 ^{o}C) ≤ 0.10 dB/km

4.8 Water penetration	**IEC 60794-1-F5**
Water height	1m
Sample length	3m
Duration	24 hrs
Test result	No water leakage at the end of the sample

4.9 Drip	**IEC 60794-1-E14**
Sample Number	3
Sample length	0.3m
Temperature	70 ^{o}C
Duration	24 hrs
Test result	No filling compound shall drip from tubes

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