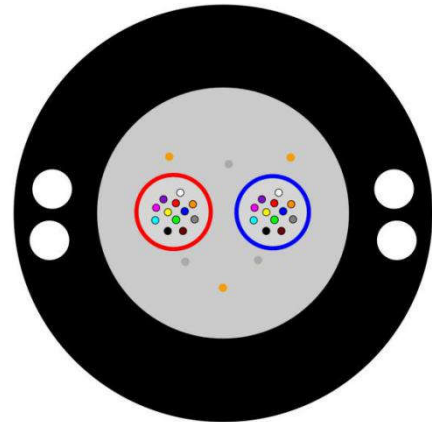


## Micro-Module Multi-Purpose Fiber Optic Cable

Type: MMMP 24/M12 G657A2 60m 4SFRP SJ HDPE CO



### Application & Standards

- ~ For aerial or duct installation;
- ~ Fully dielectric cable;
- ~ Easy strippable micro-modules without any tools needed;
- ~ IEC 60794-1-2 - Basic optical cable test procedures;
- ~ XP C 93-850-3-25 - Color code of fiber optic cables;
- ~ ITU-T G.657A2 - Characteristics of a bending-loss insensitive single-mode optical fibre and cable

### Cable Construction

- ~ Optical Fibres
- ~ Jelly
- ~ Easy strippable micromodule
- ~ Aramid Yarns
- ~ Waterproof Yarns
- ~ Strength Member (2x2 side FRP)
- ~ Outer Sheath (Black HDPE)

### Technical Characteristics

Optical Fiber Performance	
Characteristic	Specified Value
Attenuation Coefficient:	
at 1310nm :	$\leq 0.36$ dB/km
at 1550nm :	$\leq 0.22$ dB/km
Mode Field Diameter:	
at 1310nm	$8.6 \pm 0.4 \mu\text{m}$
Chromatic Dispersion:	
at 1330nm	$\leq 3.5$ ps/(nm.km)

at 1550nm	$\leq 18 \text{ ps}/(\text{nm.km})$	
at 1625nm	$\leq 22 \text{ ps}/(\text{nm.km})$	
Zero Dispersion Wavelength	1300 ~ 1324 nm	
Zero Dispersion Slope	$\leq 0.092 \text{ ps}/(\text{nm}^2.\text{km})$	
Cable Cut off Wavelength ( $\lambda_{cc}$ )	$\leq 1260 \text{ nm}$	
Macro Bending Loss	10 cycles $\varnothing$ 15mm at 1550	$\leq 0.03 \text{ dB}$
	10 cycles $\varnothing$ 15mm at 1625	$\leq 0.10 \text{ dB}$
	1 cycle $\varnothing$ 10mm at 1550	$\leq 0.10 \text{ dB}$
	1 cycle $\varnothing$ 10mm at 1625	$\leq 0.20 \text{ dB}$
	1 cycle $\varnothing$ 7.5mm at 1550	$\leq 0.50 \text{ dB}$
	1 cycle $\varnothing$ 7.5mm at 1625	$\leq 1.0 \text{ dB}$
Cladding Diameter	$125 \pm 1 \mu\text{m}$	
Cladding Non-Circularity	$\leq 1.0\%$	
Core-Cladding Concentricity error	$\leq 0.6 \mu\text{m}$	
Proof Test	$\geq 0.69 \text{ GPa}$ (100kpsi)	
Dynamic Fatigue	$\geq 20$	

Fiber Optic Cable Parameters		
Fiber Type **	G.657A2	
Fiber Count	24	
Module Count	2	
Average Outer Sheath Thickness (mm)	1.7	
Approximate Cable Diameter (mm)	7.5	
Approximate Cable Weight (kg/km)	44	
Tensile Strength (Short Term) - Fiber Strain $\leq 0.33\%$	1200 N	For 60 m span*** / Duct
Tensile Strength (Long Term) - Fiber Strain $\leq 0.1\%$	400 N	For 60 m span*** / Duct
Crush (Short Term)	2000 N/10 cm	
Impact	5J, R=300mm, 3 impacts	
Torsion	40N, 20 cycles, $\pm 90^\circ$	
Water Penetration	3m sample, 1m height, 24h	
Minimum Bending Radius (Installing)	25 x D	
Minimum Bending Radius (Operating)	15 x D	
Temperature (Operation)	$-30^\circ\text{C} \sim +70^\circ\text{C}$	
Temperature (Transportation and Storage)	$-40^\circ\text{C} \sim +70^\circ\text{C}$	
Packing	Wooden drum with protection	
Delivery Lengths	To be confirmed, $\pm 5\%$ tolerance	

Marking	<OPTIVINE> + <MICROMODULE> + <fiber count and type> + <DUCT AND AERIAL> + <manufacturing date> + <length marking>
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Fiber Color Identification												
No.	1	2	3	4	5	6	7	8	9	10	11	12
Color	Red	Blue	Green	Yellow	Violet	White	Orange	Grey	Brown	Black	Aqua	Pink

Module Color Identification****												
No.	1	2	3	4	5	6	7	8	9	10	11	12
Color	Red	Blue	Green	Yellow	Violet	White	Orange	Grey	Brown	Black	Aqua	Pink

\* Drawing it's for indicative purpose only.

\*\* Other fiber types can be used upon request.

\*\*\* A span of 60 m can be reached under NESC medium conditions (wind speed 17.7m/s, ice thickness 6.5mm).

\*\*\*\* If more than 12 tubes are used, the color code will be repeated again containing black rings

\*\*\*\*\* Customized solutions can be offered upon request.