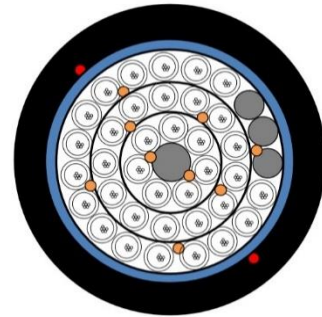


## Underground/Duct Fiber Optic Cable

Type: OPUG 864FO G652D



### Application

For installation in ducts or directly buried  
Fully dielectric cable  
~ IEEE Std P.1222 - Standard construction of composite fiber for use on electric utility power lines  
~ IEC 60793-1 - Optical fiber Part 1: Generic specifications  
~ IEC 60793-2 - Optical fiber Part 2: Product specifications  
~ IEC 60794-1-2 - Optical fiber cables – Part 4: Sectional specification – Aerial optical cables along electrical power lines  
~ EIA/TIA 598 - Color code of fiber optic cables  
~ ITU-T G.652 - Characteristics of a single-mode optical fiber cable

### Cable Construction

Central Strength Member (FRP)  
PBT Loose Tube  
Optical Fibers  
Jelly  
Filler(s)  
Water Blocking Yarn(s)  
Water Blocking Tape  
Ripcord(s)  
Outer Sheath (HDPE)

## Technical Characteristics

Optical Fiber	
Characteristic	Specified Value
Attenuation Coefficient: at 1310 nm Max : at 1550 nm Max :	$\leq 0.35$ dB/km $\leq 0.22$ dB/km
Chromatic Dispersion: between 1285 - 1330 nm: at 1550nm	$\leq 3.5$ ps/nm·km $\leq 18$ ps/nm·km
Attenuation Non-uniformity at 1310 nm at 1550 nm	$\leq 0.03$ dB $\leq 0.03$ dB
Point Discontinuity: at 1310&1550 nm	$\leq 0.1$ dB
Polarization Mode Dispersion (PMD) PMD Q value	$\leq 0.2$ ps/ $\sqrt{\text{km}}$

The optical fiber core and sheath shall be of the E9 / 125 type. The protective cover must be in direct contact with the surface of the optical fiber to protect it and avoid cracking of the optical fiber	E9 / 125 type
Cable Cut off Wavelength ( $\lambda_{cc}$ )	$\leq 1260$ nm
Mode Field Diameter: at 1310 nm at 1550 nm	$9.2 \pm 0.4 \mu\text{m}$ $10.4 \pm 0.5 \mu\text{m}$
The uniformity attenuation at any projected wavelength	$\leq 0.1$ dB/km
Cladding Diameter	$125 \pm 1.0 \mu\text{m}$
Mode field (Core/clad) concentricity error	$\leq 0.6 \mu\text{m}$
Cladding Non-Circularity	$\leq 1\%$
Coating Diameter	$245 \pm 7 \mu\text{m}$
Core / Cladding Concentricity error	$\leq 0.6 \mu\text{m}$
The increase in attenuation of 100 optical fiber cores wrapped on a 50 mm diameter chuck at 1310 nm: at 1550 nm:	$\leq 0.05$ dB; $\leq 0.05$ dB
Coating-Cladding Concentricity error	$\leq 12 \mu\text{m}$
Proof Test	$\geq 1.0\%$ , 1 sec. $\geq 0.69$ Gpa (100kpsi)
Temperature Cycling Induced Attenuation: at 1550nm and 1625 nm (-400C to +700C)	0.05dB/km
Macro bending Loss : at 1550nm and 1625 nm (100 turns; $\Phi$ 60 mm)	$\leq 0.1$ dB

Fiber Optic Cable	
Core Type *	G.652.D
Fiber Count	864
Tube Count	36
Filler Count	3
Cable Diameter (mm)	19.8
Cable Weight (kg/km)	316
Allowable Tensile Strength (short-term)	1.5 kN
Water ingress resistance	1m, 24H, 3 samples
Minimum Bending Radius (Installing)	20 x D
Minimum Bending Radius (Operating)	10 x D
Temperature (Installation)	-10°C ~ +60 °C
Temperature (Transportation and Operation)	-40°C ~ +70 °C
Life Span	>30 yr
Packing	Wooden drum with protection
Delivery Lengths	To be confirmed, $\pm 5\%$ tolerance
Marking	<OPTIVINE> + <UNDERGROUND> + <fiber count and type> + <manufacturing date> + <length marking>

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

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

\* Other fiber types can be used upon request.

\*\* When tubes go beyond 12 fibers, the colors repeat but use black rings to distinguish fibers.

\*\*\* When cables go beyond 12 tubes, the colors repeat but use a stripe to distinguish tubes. When cables go beyond 24 tubes, the colors repeat but 2 stripes are used to distinguish tubes.

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