

TECHNICAL SPECIFICATION

1. General

1.1 Scope

Cable type	Application
CT-Core 24F G652D Al-clad54 OD402	High voltage overhead

1.2 Reference

The cables provided by Navigator® need to pass the following international specifications:

IEC 60793-1	Optical fiber Part 1: Generic specifications
IEC 60793-2	Optical fiber Part 2: Product specifications
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
EIA/TIA 598 B	Color code of fiber optic cables
IEC 60794-4-10	Aerial optical cables along electrical power lines – Family specification for OPGW
IEC 60794-1-2	Optical fiber cables-Part 1-2: Generic specification-Basic optical cable test procedures
IEEE1138-2009	IEEE Standard for testing and performance for optical ground wire (OPGW) for use on electric utility power lines
IEC 61232	Aluminum – clad steel wire for electrical purposes
IEC 60104	Aluminum magnesium-silicon alloy wire for overhead line conductors
IEC 61089	Round wire concentric lay overhead electrical stranded conductors

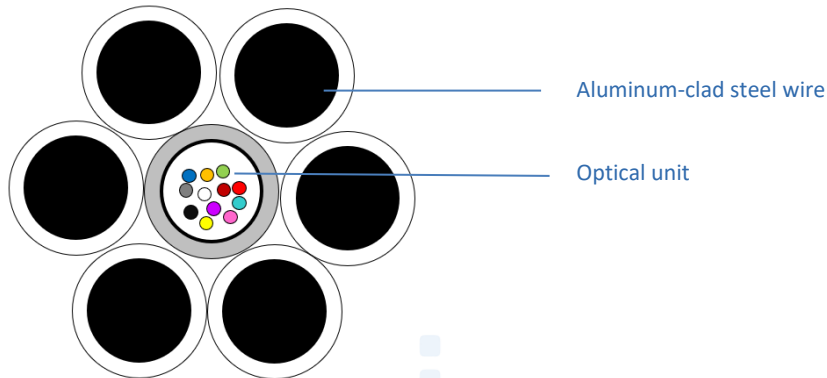
2. OPTICAL FIBER

ITU-T G.652.D		
Category	Description	Specifications
Optical Specifications	Attenuation @1310 nm	≤ 0.36 dB/km
	Attenuation @1550 nm	≤ 0.22 dB/km
	Zero Dispersion Wavelength	1300~1324 nm
	Chromatic dispersion @1310nm @1550nm @1625nm	≤ 3.5 ps/(nm·km) ≤ 18 ps/(nm·km) ≤ 22 ps/(nm·km)
	Zero Dispersion Slope	≤ 0.092 ps/nm ² ·km
	PMD _Q	≤ 0.20 ps/√km
	PMD individual value	≤ 0.2 ps/√km
	Cable Cutoff Wavelength (λ_{cc})	≤ 1260 nm
	Macro bending Loss (100 turns; $\Phi 60$ mm) @1625 nm	≤ 0.10 dB
	Mode Field Diameter @1310 nm	$(8.8-9.2) \pm 0.4 \mu\text{m}$
Dimensional Specifications	Cladding Diameter	$125 \pm 0.7 \mu\text{m}$
	Coating diameter	$245 \pm 10 \mu\text{m}$
	Core/clad concentricity error	$\leq 0.6 \mu\text{m}$
	Cladding Non-Circularity	$< 1.0\%$
Mechanical Specifications	Proof stress	≥ 0.69 GPa

3. CABLE STRUCTURE

3.1 Cable type

CT-Core 24F G652D Al-clad54 OD402



Dimensions and Properties

Structure	Position	Type of component	No. of component	Component diameter
	Fiber	G652D	24	
	Center	Stainless steel tube	1	3.40mm(0.13in)
	1 st Outer Layer	20.3% Al-clad steel wire	6	3.40mm(0.13in)

Technical Data	Compliant with IEC, IEEE standards				
	Stranding direction of outer layer is right hand(Z-stranding)				
	Cable Diameter	10.20	mm	0.402	in
	Cable Weight	389	kg/km	1,380	lbs/mile
	Total supporting Cross Sectional area	54.48	mm ²	0.08	in ²
	Cross sectional area of Al-clad steel wire	54.48	mm ²	0.08	in ²
	Rated Tensile Strength (RTS)	66.4	kN	14,927	lbs
	Modulus of Elasticity (E-Modulus)	162.0	kN/mm ²	23,496	kpsi
	Thermal Elongation Coefficient	13.0×10 ⁻⁶	/°C	7.22×10 ⁻⁶	/°F
	Permissible Maximum Working Stress (42% RTS)	511.7	N/mm ²	74,216	psi
	Everyday Stress (EDS) (16%~25% RTS)	194.9 ~ 304.6	N/mm ²	28,268~44,179	psi
	DC Resistance	1.578	Ω/km	2.54	Ω/mile
	Short Time Current (0.25s, Initial= 20°C)	9.7		kA	
	Short Time Current Capacity	23.6		kA ² S	
	Minimum Bending Radius for installation:	204	mm	8.03	in
	Minimum Bending Radius for operation:	153	mm	6.02	in

	Installation	-10°C to +50°C	+14°F to + 122°F
	Transportation and Operation	-40°C to +85°C	-40 °F to +185 °F

Note: All Sizes and Values are Nominal Values

Diameter Tolerance: $\pm 1\%$; Weight Tolerance: $\pm 2\%$;

4. COLOR CODE SCHEME

Fiber color	blue	orange	green	brown	slate	white	red	Natural	yellow	violet	pink	aqua
Tube color	/											

Note: Tracers are added to differentiate the fibers when there are 13 or more.

5. TEST REQUIREMENTS FOR OPGW

Test items	Test Procedure
Tests on fibers	
Mode field diameter	IEC 60793-1-45
Geometric parameter	IEC 60793-1-20
Attenuation (OTDR)	IEC 60793-1-40
Chromatic dispersion	IEC 60793-1-42
Cut-off wavelength (cable cut off)	IEC 60793-1-44
Tests on wires before stranding	
Diameter	IEC61232/ IEC60104
Tensile strength	IEC61232/ IEC60104
Stress at 1% extension (Only ACS wire)	IEC61232
Elongation at break	IEC61232/ IEC60104
Wrapping test (Only AA wire)	IEC60104
Conductivity	IEC61232/ IEC60104
Thickness of Al-cladding (Only ACS wire)	IEC61232
Torsion test (Only ACS wire)	IEC61232
Tests on OPGW	
Quality of surface	IEC 60794-4-10
Direction of lay outer	IEC 60794-4-10
Lay length	IEC 60794-4-10
Diameter of cable	IEC 60794-4-10
Weight of Cable	IEC 60794-4-10
DC-resistance	IEC 60794-4-10
Breaking strength test	IEC 60794-4-10

Stress Strain Test	IEC 60794-4-10
Tensile performance test	IEC 60794-4-10
Sheave test	IEC 60794-4-10
Aeolian vibration simulation	IEC 60794-4-10
Galloping test	IEC 60794-4-10
Creep test	IEC 60794-4-10
Temperature cycle test	IEC 60794-4-10
Water penetration	IEC 60794-4-10
Short circuit current test	IEC 60794-4-10
Lightning test	IEC 60794-4-10

