

User / Customer :	Doc. No:
Project Title :	
Contractor :	Page 1 of 5
Specification for Optical Ground Wire (OPGW) [CS(AT)-OPGW-55/0-24S]	

Index

Sl. No.	Content	Page No
1	Scope	3
2	Technical Particular of Optical Fiber	3
3	Technical Particular of OPGW	3
4	Technical Particular of Conductor Strands (Before Stranding)	4
5	Packaging and Reel Description	4
6	List of Appendix	
	Appendix A. Typical Construction Diagram of OPGW	5
	Appendix B. Color Code of Optical Fiber Unit	5
	Appendix C. Typical Diagram and Dimension of Steel Reel	5

Technical Particulars of Optical Fiber

Description	Unit	Proposal Data
Applicable standard	-	ITU-T G.652D
Mode field diameter	μm	(8.6 to 9.5) ± 0.6
Cladding diameter	μm	125 ± 1.0
Coating diameter(uncolored)	μm	245 ± 15
Mode field concentricity error	μm	≤ 0.6
Cladding non-circularity	%	≤ 1.0
Attenuation coefficient at 1310 nm at 1550 nm	dB/km	≤ 0.35 ≤ 0.21
Chromatic dispersion at (1288-1339) nm at (1271-1360)nm at 1550 nm	ps/nm.km	≤ 3.5 ≤ 5.3 ≤ 18
Zero dispersion wavelength	nm	1300~1324
Zero Dispersion Slope	Ps/(nm ² xkm)	≤ 0.092
Cable cutoff wavelength(λ _{cc})	nm	≤ 1260
Polarization Mode Dispersion (PMD _Q)	ps/√km	≤ 0.2
Bend Performance; Induced attenuation		
@ 1310nm: (75±2mm dia. Mandrel), 100 turns		Induced attenuation ≤ 0.05dB
@ 1550nm: (75±2mm dia. Mandrel), 100 turns		Induced attenuation ≤ 0.10dB
@ 1550nm: (32±0.5mm dia. Mandrel), 1 turn		Induced attenuation ≤ 0.5dB
Temperature Dependence Induced attenuation		≤ 0.05dB/km @1550nm (-60 °C to +85 °C)
Proof Test Level	Kpsi	≥ 100Kpsi or ≥ 0.69GPa

3. Technical Particulars of OPGW

Description	Unit	Proposal Data
Applicable standard	-	IEEE 1138
Number of optical fibers SMF (G.652D)	Nos.	24
Construction Center: Aluminum Covered SSLT tube 1 st Layer: Aluminum-clad steel wire	Nos./ dia. (mm)	1/5.53 ± 0.1 9/2.80 (20.3 %IACS)
Outer stranding direction	direction	Left-hand (S)
Ratio of length of lay of a layer to nominal outside diameter of that layer	times	10 ~ 16
Overall diameter	mm	11.10 ± 0.20
Total cross-section area for tension bearing	mm ²	55.42
Nominal weight	kg/km	432 ± 10
Minimum breaking load (RTS) / Ultimate tensile strength (UTS)	kN	70.27
Final modulus of elasticity for stress-strain calculus	kN/mm ²	118.94
Coefficient of linear expansion	x 10 ⁻⁶ /°C	14.0
D.C resistance at 20°C	Ω/km	< 1.0
Short circuit current ^{NOTE1)} (for 1s)	kA.s	≥ 6.32
Maximum allowable temperature	Continuous for OPGW	°C
	Instantaneous for optical unit	°C
	Instantaneous for outer layer	°C
Maximum everyday stress (EDS)	-	20%
Maximum allowable tension (MAT)	-	40%

NOTE 1) - Short circuit current is based on initial/maximum temperature of 20 °C /230 °C.

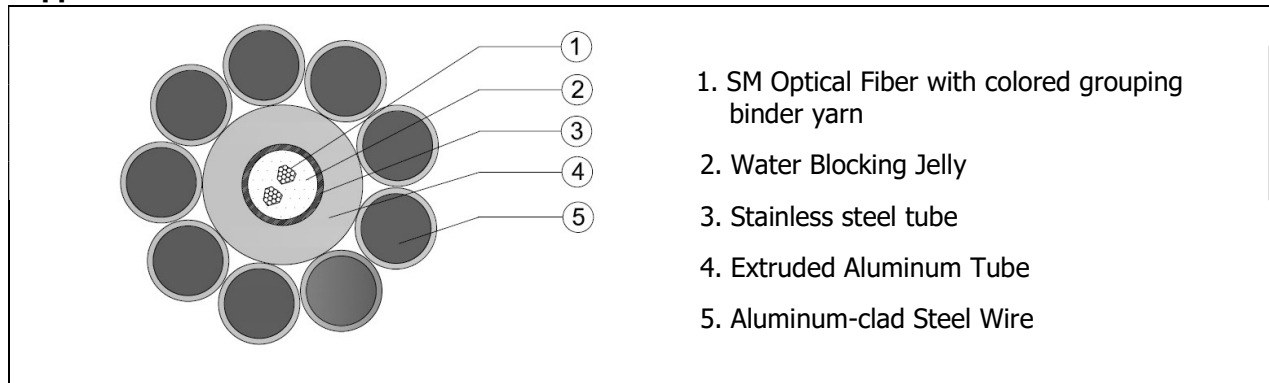
4. Technical Particulars of Strands (Before stranding)

Description	Unit	Proposal Data
Type of individual wire	-	Aluminum-clad steel wire
Applicable standard	-	IEC 61232
Standard diameter	mm	2.80
Tolerance of diameter	mm	± 0.04
Tensile strength	kg/mm ²	134.64
Minimum elongation at fracture	%	1.5
Minimum conductivity at 20°C	%IACS	20.3
Minimum number of twisting	No.	20
Minimum thickness of aluminum	mm	0.14
Properties of wrapping	%	N/A

5. Packaging and Reel Description

The OPGW cable shall be packaged in steel reels according to the best commercial practices. Each length of cable shall be wound on a separate cable reel. Refer to appendix C.

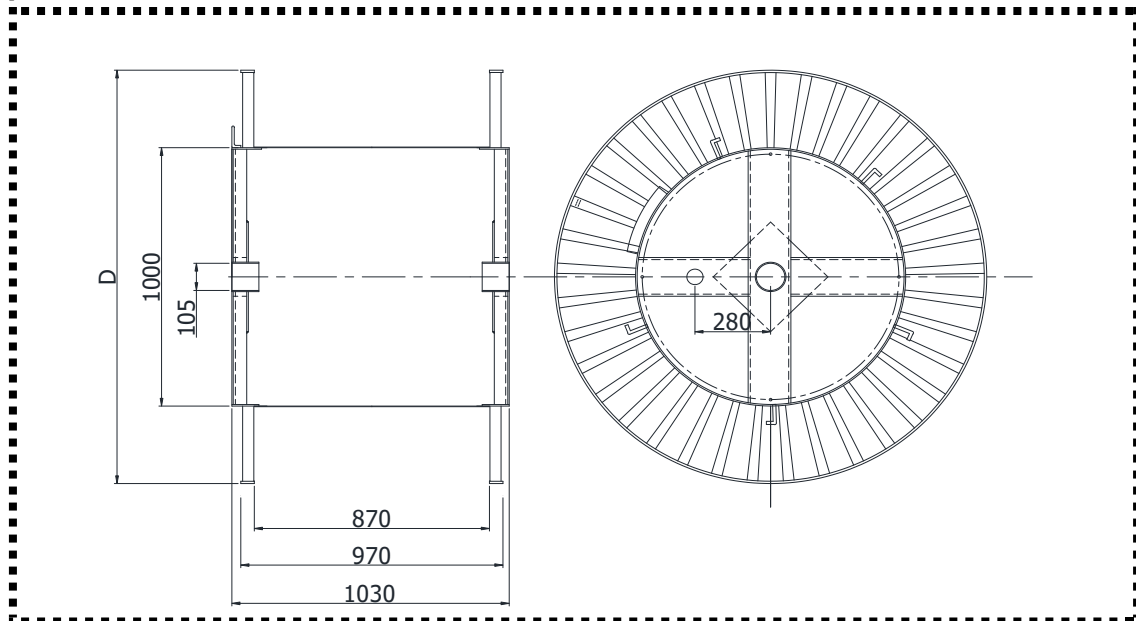
Appendix A. Cross-section view of OPGW



Appendix B. Color Code of Optical Fiber Unit

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

Appendix C. Cross-sectional View of Steel Reel



- * Note: a. Reels will have suitable flange diameter (D) for winding a specified length
b. OPGW length per reel: $\leq 5,000\text{m}$
c. All dimensions are for reference, actual dimension will be given later.

=== End of Specification ===