



Yangtze Optical Fibre and Cable Joint Stock Limited Company

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Optical Fibre Composite Overhead Ground Wire (OPGW)





Yangtze Optical Fibre and Cable Joint Stock Limited Company (also known as ‘YOFC’) is established in Wuhan, Hubei Province in May 1988. It’ s a technologically innovative enterprise specializing in optical fibre preforms, optical fibres, optical fibre cables and integrated solutions. It is also a global leading supplier of optical fibre preforms, optical fibres and optical fibre cables.

YOFC was listed on the Hong Kong Stock Exchange on December 10, 2014(Stock Code: 06869.HK), and listed on the Shanghai Stock Exchange on July 20, 2018 (Stock Code: 601869.SH), and is the only A&H shares company in China’ s optical fibre and cable industry as well as the first one in Hubei Province.

YOFC mainly produces and sells different types of optical fibre preforms, optical fibres and optical fibre cables that widely installed in telecommunications industry, customized specialty optical fibres and optical fibre cables, RF coaxial cables and accessories. YOFC also provides the integrated systems, project design and services. In addition, YOFC is equipped with a full series of optical fibres , optical fibre cables and solutions, providing a variety of different products and solutions for world’ s telecommunications industry and other industries (e.g. Public utility, Transportation, Oil & Chemistry and Medication etc.) and offering its products and services to over 70 countries and regions around the world.

Through introduction, digestion, absorption and re-innovation since its establishment, YOFC has carried out a way to successfully revitalize national industry. YOFC has mastered 3 types of optical fibre preform manufacturing technology (PCVD/OVD/VAD), and honored many awards & reputations such as National Enterprise Technical Center, National First Batch Intelligent Manufacturing Pilot Enterprise, the Second Class National Science and Technology Progress Award(3 times), the China Quality Award, the European Quality Award, etc. In addition, YOFC has obtained over 400 national-granted patents and several foreign invention patents from Europe, US and Japan, and was nominated the support organization for State Key Laboratory in optical fibre and optical fibre cable manufaction technology. It’ s also one of the significant members in ITU-T and IEC in setting international standards.

Adhering to the mission of ‘Smart Link Better Life’ , YOFC devotes itself to becoming the leader in information transmission and smart links through its core value ‘Client Focus Accountability Innovation Stakeholder Benefits’ , and builds its strategies in the following 5 aspects: Organic growth strategy of the preform, optical fibre and cable business; Strategy for technological innovation and smart manufacturing; Strategy for internationalization and expansion of business scope; Related diversification strategy; Capital operation strategy for synergy in development.

Optical Fibre Composite Overhead Ground Wire (Uni-tube)

Optical fibre composite overhead ground wire (OPGW) is an overhead ground wire containing optical fibre. It has multiple functions such as overhead ground wire and optical communication. It is mainly used for communication lines of 110KV, 220KV, 500KV, 750KV and new overhead high-voltage transmission system. It can also be used to replace the existing ground lines of the old overhead high voltage transmission system, add the optical communication line, transmit short time current and provide anti lightning protection. Other structures can be customized on request.

Features and Benefits

- Stainless steel tubes filled with hydrophobic gel provide the protection and support of the optical fibres
- Good tensile performance
- Small diameter, light weight, low additional load to the tower
- Appropriate fibre excess length of optical unit easliy to make

Optical Fibre Characteristics

	Attenuation				Bandwidth		Polarization Mode Dispersion	
	@850nm	@1300nm	@1310nm	@1550nm	@850nm	@1300nm	Individual Fibre	Design Link Value (M=20, Q=0.01%)
G652D	—	—	≤0.35dB/km	≤0.21dB/km	—	—	≤0.20ps/√km	≤0.1ps/√km
G655	—	—	—	≤0.22dB/km	—	—	≤0.20ps/√km	≤0.1ps/√km
50/125μm	≤3.0dB/km	≤1.0dB/km	—	—	≥600MHz.km	≥1200MHz.km	—	—
62.5/125μm	≤3.5dB/km	≤1.0dB/km	—	—	≥200MHz.km	≥600MHz.km	—	—



Constructions and Performance

	Classification	Material	Value
Construction	Optical Fibre	G652D/G655 etc.	2~48
	Protection Tube	Stainless steel tube	1.5~6mm
	Stranded Line	AS wire/AA wire/Al Rod	1.5~6mm
	Max. Diameter		18mm
	Max. Cross Section		200mm²
Characteristic	According to the standards as DL/T 832, IEC60794-4-10, IEEE1138		
	Max. Tensile Strength (RTS) (kN)		280
	Max. Crush Strength (N/100mm)		2200
	Max. Short Current Capacity (40°C~200°C)(kA²s)		100
	Min. Bending Radius (Dynamic)		20D
Environment Performance	Min. Bending Radius (Static)		15D
	Installation (°C)		-10~+50
	Transportation and Operation (°C)		-40~+65

Note:D is cable diameter.

Specific Type and Technical Data

No.	Technical Data								
	Product Type	Structure Type	Max. Fibre Count	Section of AS Wire (mm²)	Diameter (mm)	Cable Weight (kg/km)	Rate Tensile Strength (kN)	20°CDC Resistance (Ω/km)	Short Time Current Capacity (40-200°C kA².s)
1	OPGW-24B1.3-40-[51;9]	6/3.0/20AS, Optical Unit 1/3.0	24	≈40	9.0	≤304	≥51	≤2.10	≥9
2	OPGW-24B1.3-50-[58;11.5]	6/3.2/20AS, Optical Unit 1/3.2	24	≈50	9.6	≤345	≥58	≤1.82	≥11.5
3	OPGW-48B1.3-70-[77;24]	6/3.8/20AS, Optical Unit 1/3.8	48	≈70	11.4	≤475	≥77	≤1.30	≥24
4	OPGW-48B1.3-70-[42;38]	6/3.8/40AS, Optical Unit 1/3.8	48	≈70	11.4	≤340	≥42	≤0.70	≥38

Other optical fibre type and count, stranded wire are available om request.

Mechanical and Environmental Test Characteristics

Item	Test Method	Requirements
Tension	IEC 60794-1-2-E1 Load: according to cable structure Sample length: no less than 10m, linked length no less than100m Duration time: 1min	40%RTS no additional fibre strain (0.01%) , no additional attenuation (0.03dB). 60%RTS fibre strain≤0.25%, additional attenuation≤0.05dB (No additional attenuation after test).
Crush	IEC 60794-1-2-E3 Load: according to above table, three points Duration time: 10min	Additional attenuation at 1550nm ≤0.05dB/fibre; No damage to the elements
Water Penetration	IEC 60794-1-2-F5B Time : 1 hour Sample length: 0.5m Water height: 1m	No water leakage.
Temperature Cycling	IEC 60794-1-2-F1 Sample length: No less than 500m Temperature range: -40°C~+65°C Cycles: 2 Temperature cycling test dwell time: 12h	The change in attenuation coefficient shall be less than 0.1dB/km at 1550nm.

Packaging and Drum

- Standard Cable Drum
- Standard reel length: 2/3km/reel, other length is also available



Optical Fibre Composite Overhead Ground Wire (Stranded-tube)

Optical fibre composite overhead ground wire (OPGW) is an overhead ground wire containing optical fibre. It has multiple functions such as overhead ground wire and optical communication. It is mainly used for communication lines of 110KV, 220KV, 500KV, 750KV and new overhead high-voltage transmission system. It can also be used to replace the existing ground lines of the old overhead high voltage transmission system, add the optical communication line, transmit short time current and provide anti lightning protection. Other structures can be customized on request.

Features and Benefits

- Stainless steel tubes filled with hydrophobic gel provide the protection and support of the optical fibres
- Accurate process control ensures good mechanical and temperature performances
- Larger diameter, larger fibre count
- Stable structure and high reliability
- High tensile strength and large short time current capacity to reach optimum balance of mechanical and electrical properties

Optical Fibre Characteristics

	Attenuation				Bandwidth		Polarization Mode Dispersion	
	@850nm	@1300nm	@1310nm	@1550nm	@850nm	@1300nm	Individual Fibre	Design Link Value (M=20, Q=0.01%)
G652D	—	—	≤0.35dB/km	≤0.21dB/km	—	—	≤0.20ps/√km	≤0.1ps/√km
G655	—	—	—	≤0.22dB/km	—	—	≤0.20ps/√km	≤0.1ps/√km
50/125μm	≤3.0dB/km	≤1.0dB/km	—	—	≥600MHz.km	≥1200MHz.km	—	—
62.5/125μm	≤3.5dB/km	≤1.0dB/km	—	—	≥200MHz.km	≥600MHz.km	—	—



Constructions and Performance

	Classification	Material	Value
Construction	Optical Fibre	G652D/G655 etc.	2~144
	Protection Tube	Stainless steel tube	1.5~6mm
	Stranded Line	AS wire/AA wire/Al Rod	1.5~6mm
	Max. Diameter		30mm
	Max. Cross Section		500mm²
Characteristic	According to the standards as DL/T 832, IEC60794-4-10, IEEE1138		
	Max. Tensile Strength (RTS) (kN)		700
	Max. Crush Strength (N/100mm)		3000
	Max. Short Current Capacity (40°C~200°C)(kA²s)		2000
	Min. Bending Radius (Dynamic)		20D
Environment Performance	Min. Bending Radius (Static)		15D
	Installation (°C)		-10~+50
	Transportation and Operation (°C)		-40~+65

Note:D is cable diameter.

Specific Type and Technical Data

No.	Technical Data								
	Product Type	Structure Type	Max. Fibre Count	Section of AS Wire (mm²)	Diameter (mm)	Cable Weight (kg/km)	Rate Tensile Strength (kN)	20°CDC Resistance (Ω/km)	Short Time Current Capacity (40-200°C kA².s)
1	OPGW-48B1.3-90-[112;45]	1/2.6/20AS+4/2.5/20AS+11/2.8/20AS, Optical Unit 2/2.5	48	≈90	13.2	≤641	≥112	≤0.98	≥45
2	OPGW-48B1.3-90-[57;67]	1/2.6/40AS+4/2.5/40AS+11/2.8/40AS, Optical Unit 2/2.5	48	≈90	13.2	≤457	≥57	≤0.52	≥67
3	OPGW-24B1.3-100-[118;50]	1/2.6/20AS+5/2.5/20AS+11/2.8/20AS, Optical Unit 1/2.5	24	≈100	13.2	≤674	≥118	≤0.93	≥50
4	OPGW-24B1.3-100-[60;74]	1/2.6/40AS+5/2.5/40AS+11/2.8/40AS, Optical Unit 1/2.5	24	≈100	13.2	≤479	≥60	≤0.49	≥74
5	OPGW-24B1.3-110-[133;63]	1/2.6/20AS+5/2.5/20AS+10/3.2/20AS, Optical Unit 1/2.5	24	≈110	14	≤760	≥133	≤0.83	≥63
6	OPGW-24B1.3-110-[140;68]	1/2.8/20AS+5/2.7/20AS+11/3.05/20AS, Optical Unit 1/2.6	24	≈110	14.3	≤791	≥140	≤0.80	≥68
7	OPGW-24B1.3-110-[67;95]	1/2.9/20AS+5/2.8/20AS+12/2.8/AA, Optical Unit 1/2.7	24	≈37 ≈74(AA)	14.1	≤473	≥67	≤0.40	≥95
8	OPGW-36B1.3-120-[145;73]	1/3.0/20AS+5/2.9/20AS+12/2.9/20AS, Optical Unit 1/2.8	36	≈120	14.6	≤820	≥145	≤0.77	≥73
9	OPGW-36B1.3-120-[95;98]	1/3.0/30AS+5/2.9/30AS+12/2.9/30AS, Optical Unit 1/2.8	36	≈120	14.6	≤700	≥95	≤0.55	≥98
10	OPGW-36B1.3-120-[74;110]	1/3.0/40AS+5/2.9/40AS+12/2.9/40AS, Optical Unit 1/2.8	36	≈120	14.6	≤582	≥74	≤0.42	≥110
11	OPGW-72B1.3-120-[147;76]	1/3.2/20AS+4/3.0/20AS+12/3.0/20AS, Optical Unit 2/2.9	72	≈120	15.2	≤832	≥147	≤0.76	≥76
12	OPGW-72B1.3-120-2[96;101]	1/3.2/30AS+4/3.0/30AS+12/3.0/30AS, Optical Unit 2/2.9	72	≈120	15.2	≤711	≥96	≤0.53	≥101
13	OPGW-72B1.3-120-[74;114]	1/3.2/40AS+4/3.0/40AS+12/3.0/40AS, Optical Unit 2/2.9	72	≈120	15.2	≤591	≥74	≤0.40	≥114
14	OPGW-36B1.3-130-[155;85]	1/3.2/20AS+5/3.0/20AS+12/3.0/20AS, Optical Unit 1/2.9	36	≈130	15.2	≤879	≥155	≤0.72	≥85
15	OPGW-36B1.3-130-[102;114]	1/3.2/30AS+5/3.0/30AS+12/3.0/30AS, Optical Unit 1/2.9	36	≈130	15.2	≤751	≥102	≤0.50	≥114
16	OPGW-36B1.3-130-[79;137]	1/3.2/40AS+5/3.0/40AS+12/3.0/40AS, Optical Unit 1/2.9	36	≈130	15.2	≤624	≥79	≤0.40	≥137
17	OPGW-36B1.3-140-[175;100]	1/3.3/20AS+5/3.2/20AS+12/3.2/20AS, Optical Unit 1/3.1	36	≈140	16.1	≤995	≥175	≤0.65	≥100
18	OPGW-36B1.3-140-[115;140]	1/3.3/30AS+5/3.2/30AS+12/3.2/30AS, Optical Unit 1/3.1	36	≈140	16.1	≤850	≥115	≤0.45	≥140
19	OPGW-36B1.3-145-[86;170]	1/3.3/20AS+5/3.2/20AS+12/3.2/AA, Optical Unit 1/3.1	36	≈49 ≈96(AA)	16.1	≤611	≥86	≤0.31	≥170
20	OPGW-48B1.3-150-[182;123]	1/3.4/20AS+5/3.3/20AS+12/3.3/20AS, Optical Unit 1/3.2	48	≈150	16.6	≤1055	≥182	≤0.60	≥123
21	OPGW-48B1.3-150-[122;165]	1/3.4/30AS+5/3.3/30AS+12/3.3/30AS, Optical Unit 1/3.2	48	≈150	16.6	≤901	≥122	≤0.42	≥165
22	OPGW-48B1.3-150-[95;195]	1/3.4/40AS+5/3.3/40AS+12/3.3/40AS, Optical Unit 1/3.2	48	≈150	16.6	≤747	≥95	≤0.33	≥195
23	OPGW-72B1.3-150-[172;110]	1/3.4/20AS+4/3.3/20AS+12/3.3/20AS, Optical Unit 2/3.2	72	≈150	16.6	≤998	≥172	≤0.64	≥110
24	OPGW-72B1.3-150-[116;147]	1/3.4/30AS+4/3.3/30AS+12/3.3/30AS, Optical Unit 2/3.2	72	≈150	16.6	≤853	≥116	≤0.45	≥147
25	OPGW-48B1.3-170-[198;150]	1/3.6/20AS+5/3.5/20AS+12/3.5/20AS, Optical Unit 1/3.4	48	≈170	17.6	≤1190	≥198	≤0.54	≥150

No.	Technical Data								
	Product Type	Structure Type	Max. Fibre Count	Section of AS Wire (mm²)	Diameter (mm)	Cable Weight (kg/km)	Rate Tensile Strength (kN)	20°CDC Resistance (Ω/km)	Short Time Current Capacity (40-200°C kA².s)
26	OPGW-72B1.3-170-[199;156]	1/3.8/20AS+4/3.6/20AS+12/3.6/20AS, Optical Unit 2/3.5	72	≈170	18.2	≤1187	≥199	≤0.54	≥156
27	OPGW-48B1.3-180-[252;125]	1/3.8/14AS+5/3.6/14AS+12/3.6/14AS, Optical Unit 1/3.5	48	≈180	18.2	≤1372	≥252	≤0.72	≥125
28	OPGW-48B1.3-180-[211;175]	1/3.8/20AS+5/3.6/20AS+12/3.6/20AS, Optical Unit 1/3.5	48	≈180	18.2	≤1255	≥211	≤0.50	≥175
29	OPGW-48B1.3-180-[147;234]	1/3.8/30AS+5/3.6/30AS+12/3.6/30AS, Optical Unit 1/3.5	48	≈180	18.2	≤1071	≥147	≤0.35	≥234
30	OPGW-48B1.3-180-[113;262]	1/3.8/40AS+5/3.6/40AS+12/3.6/40AS, Optical Unit 1/3.5	48	≈180	18.2	≤888	≥113	≤0.28	≥262
31	OPGW-48B1.3-235-[268;243.4]	1/2.7/20AS+4/2.5/20AS+12/2.5/20AS+13/3.8/20AS, Optical Unit 1/3.5	48	≈235	20.3	≤1594	≥268	≤0.38	≥243.4

Other optical fibre type and count, stranded wire are available om request.

Mechanical and Environmental Test Characteristics

Item	Test Method	Requirements
Tension	IEC 60794-1-2-E1 Load: according to cable structure Sample length: no less than 10m, linked length no less than100m Duration time: 1min	40%RTS no additional fibre strain (0.01%) , no additional attenuation (0.03dB). 60%RTS fibre strain≤0.25%, additional attenuation≤0.05dB (No additional attenuation after test).
Crush	IEC 60794-1-2-E3 Load: according to above table, three points Duration time: 10min	Additional attenuation at 1550nm ≤0.05dB/fibre; No damage to the elements
Water Penetration	IEC 60794-1-2-F5B Time : 1 hour Sample length: 0.5m Water height: 1m	No water leakage.
Temperature Cycling	IEC 60794-1-2-F1 Sample length: No less than 500m Temperature range: -40°C~+65°C Cycles: 2 Temperature cycling test dwell time: 12h	The change in attenuation coefficient shall be less than 0.1dB/km at 1550nm.

Packaging and Drum

- Standard Cable Drum
- Standard reel length: 2/3km/reel, other length is also available