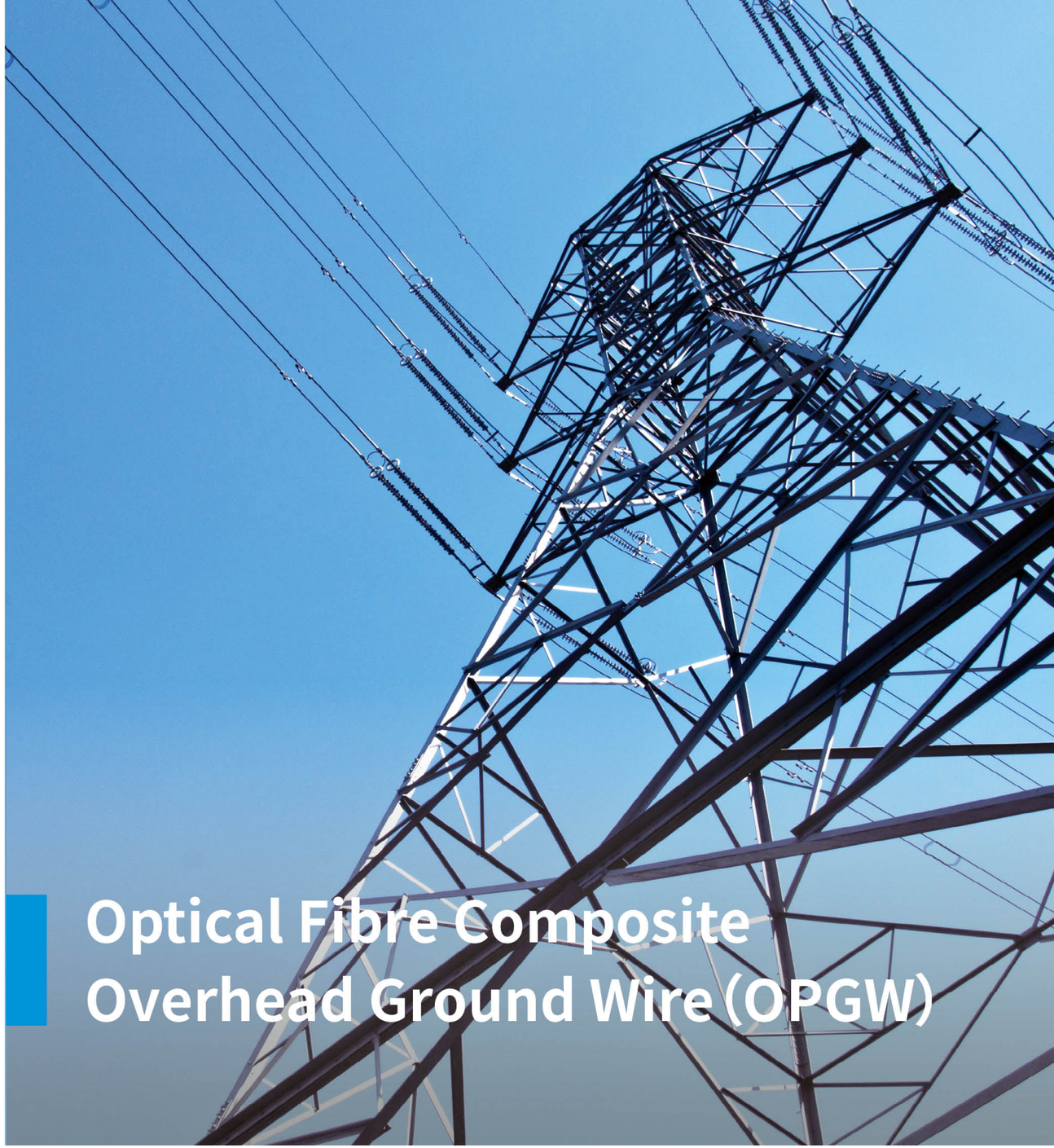


Optical Fibre Composite Overhead Ground Wire (OPGW)

Smart Link Better Life.

Yangtze Optical Fibre and Cable Joint Stock Limited Company

Stock Code: 601869.SH 06869.HK

ADD: No.9 Optics Valley Avenue, Wuhan, Hubei, China(P.C.: 430073)

Tel: 400-006-6869 **Email:** 400@yofc.com

en.yofc.com

Facebook: Yangtze Optical Fibre and Cable Joint Stock Limited Company

LinkedIn: Yangtze Optical Fibre and Cable Joint Stock Limited Company

WeChat

Smart Link Better Life.

Yangtze Optical Fibre and Cable Joint Stock Limited Company (also known as 'YOFC') was established in Wuhan, Hubei Province in May 1988. It's an innovative technology-driven enterprise specialized in manufacturing optical fibre preforms, optical fibres, optical fibre cables and providing integrated solution services.

YOFC was listed on the Main Board of Hong Kong Stock Exchange on December 10, 2014(Stock Code: 06869.HK), and listed on the Main Board of Shanghai Stock Exchange on July 20, 2018 (Stock Code: 601869.SH), which made YOFC the only A&H shares dual-listed company in China' s optical fibre and cable industry and the first one in Hubei Province.

YOFC mainly produces and sells different types of optical fibre preforms, optical fibres and optical fibre cables that are widely applied in telecommunications industry, customized optical modules, specialty optical fibres, active optical cables, submarine cables, RF coaxial cables and accessories, etc. YOFC is also equipped with some solutions and services such as system integration and communication engineering design. Providing a variety of different products and solutions for world' s telecommunications industry and other industries (e.g. Public utility, Transportation, Oil & Chemistry, Medication etc.) , YOFC has offered its products and services to over 70 countries and regions around the world.

It has made the great strides from the initial technology cooperation to the current self-innovation since its inception to contribute to revitalizing national industry. YOFC masters 3 major preform manufacturing techniques: PCVD/O-VD/VAD, and has been honored with many awards & reputations such as National Enterprise Technical Center, National First Batch Smart Manufacturing Pilot Enterprise, Industrial Internet Platform Integrated Innovative Application Pilot Demonstration Project, 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 700 national-granted patents and several foreign invention patents from Europe, US and Japan, and boasted State Key Laboratory of Optical Fibre and Cable Manufacture Technology. It's also one of the members in ITU-T and IEC in setting international standards.

Guided by the mission of 'Smart Link Better Life' , YOFC devotes itself to becoming the leader in information transmission and smart link with its core values 'Client Focus Accountability Innovation Stakeholder Benefits' in the center of everything it does. YOFC builds its strategies in the following 5 aspects: Organic growth of the preform, optical fibre and cable business,technological innovation and smart manufacturing, internationalization, relevant diversification and capital optimization.

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/$\sqrt{km}$	⩽0.1ps/$\sqrt{km}$
G655	—	—	—	⩽0.22dB/km	—	—	⩽0.20ps/$\sqrt{km}$	⩽0.1ps/$\sqrt{km}$
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		200mm^2
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)(kA^{2}s)		100
	Min. Bending Radius (Dynamic)		20D
	Min. Bending Radius (Static)		15D
Environment Performance	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 (mm^2)	Diameter (mm)	Cable Weight (kg/km)	Rate Tensile Strength (kN)	20°CDC Resistance (Ω/km)	Short Time Current Capacity (40-200°C $kA^2.s$)
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

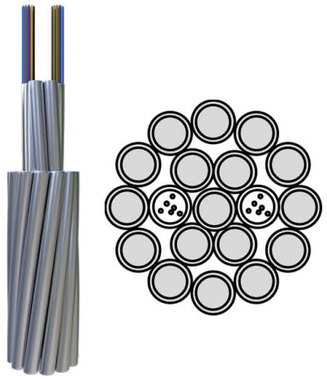
Other optical fibre type and count, stranded wire are available om request.

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/$\sqrt{km}$	⩽0.1ps/$\sqrt{km}$
G655	—	—	—	⩽0.22dB/km	—	—	⩽0.20ps/$\sqrt{km}$	⩽0.1ps/$\sqrt{km}$
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
	Min. Bending Radius (Static)		15D
Environment Performance	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 (mm^2)	Diameter (mm)	Cable Weight (kg/km)	Rate Tensile Strength (kN)	20°CDC Resistance (Ω/km)	Short Time Current Capacity (40-200°C $kA^2.s$)
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
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.

Packaging and Drum

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

Network Access License & Test Report

电力专用通信设备进网许可证

Network Access License for Special Telecommunications Equipment in Electric Power System

许可证号: OPGW-074-2018-005
License NO.

经审查，下述电力专用通信设备符合进网要求，准许进入电力通信网使用，特发此证。

This is to certify that the use of the following equipment, after examination, has been approved in the electric power telecommunications network, considering it to be compliant with the requirements for network access.

申请单位 Applicant: 长飞光纤光缆股份有限公司
设备名称 Equipment Name: 光纤复合架空地线
生产企业 Manufacturer: 长飞光纤光缆股份有限公司
设备型号 Model Number: OPGW-24B1+12ULL-240[267.5;243.4]
设备产地 Origin: 武汉市
发证日期 Date of Issue: 2018 年 10 月 12 日
有效期至 Date of Expiry: 2022 年 10 月 11 日

检 测 报 告

CEPRI-TX1-2018-004

样品名称： 光纤复合架空地线（OPGW）
样品型号： OPGW-24B1+12B4-70[77.24.0]
生产单位： 长飞光纤光缆股份有限公司
委托单位： 长飞光纤光缆股份有限公司
检测类别： 型式试验

中国电力科学研究院有限公司
2018 年 07 月 03 日

检 测 报 告

CEPRI-TX1-2018-005

样品名称： 光纤复合架空地线（OPGW）
样品型号： OPGW-36B1-145[86;170]
生产单位： 长飞光纤光缆股份有限公司
委托单位： 长飞光纤光缆股份有限公司
检测类别： 型式试验

中国电力科学研究院有限公司
2018 年 07 月 03 日

Test Repor

检 测 报 告
Test Report

样品名称 Name of sample: Optical Fibre Composite Overhead Ground Wire
样品型号 Type of sample: OPGW-12B1+12B4+36ULL-175[199;157.0]
委托方 Consigner: Yangtze Optical Fibre and Cable Joint Stock Limited Company
试验类型 Kind of test: Type Test

上海国缆检测中心有限公司
SHANGHAI NATIONAL CENTER OF TESTING AND INSPECTION FOR ELECTRIC CABLE AND WIRE CO.,LTD

检 测 报 告

CEPRI-TX1-2018-003

样品名称： 光纤复合架空地线（OPGW）
样品型号： OPGW-24B1+12ULL-240[267.5;243.4]
生产单位： 长飞光纤光缆股份有限公司
委托单位： 长飞光纤光缆股份有限公司
检测类别： 入网型式试验

中国电力科学研究院有限公司
2018 年 04 月 26 日

检 测 报 告

CEPRI-TX1-2020-083

样品名称： 光纤复合架空地线（OPGW）
样品型号： OPGW-120Bx-340[471;505.4]
生产单位： 长飞光纤光缆股份有限公司
委托单位： 长飞光纤光缆股份有限公司
检测类别： 型式试验

中国电力科学研究院有限公司
2021 年 03 月 08 日