

## 光纤复合架空相线 — OPPC

光纤复合架空相线OPPC ( Optical Fiber Composition Phase Conductor,简称OPPC ) 是将光纤单元复合在相线中的光缆。

OPPC充分利用电力系统自身的线路资源，避免在频率资源、路由协调、电磁兼容等方面与外界的矛盾、用于电力通信的一种新型特种电力光缆。二十世纪80年代，一些国家允许将OPPC用于200kV以下的电力系统中，并已经在欧洲、美洲等国家架设运行。

在我国现行电网中，一般都采用三相电力系统传输，系统的电力通讯则采用传统的方式进行。如果用OPPC替代三项中的一相，形成由两根导线和一根OPPC组合而成的三相电力系统，不需要另外架设通信线路就可以解决这类电网的自动化、调度、通信等问题，并可大大提高传输的质量和数量。

## 工程设计与施工

OPPC在工程设计中可以参照OPGW和三相导线的设计规范。如弧垂张力、挂点的计算、配盘、档距等。在OPPC工程的施工中，需要在运行的相线中将光纤单元分离出来，涉及到光纤接续和光电分离技术。对接续的技术、高压绝缘有严格要求。

OPPC的接头盒和其他光缆使用的接头盒不同，分为中间接头盒和终端接头盒。在国外产品成熟的基本上，国内已自行研制出同类的产品。

目前我公司已经在10kV、35kV、110kV、220kV等线成功挂网运行了数条线路，最长时间已达七年。

## OPPC ( Optical Fiber Composition Phase Conductor)

Is the cable which composes the optical fiber unit into the phase line.

OPPC is designed as a new type of special electric power optical fiber cable for power telecommunication which will make full use of the Line resources, it is existing power system to prevent the resistance of the aspects of frequency resources,router coordination and electronic magnertic compatability from the environment.

OPPC began to be installed in the electric system of no higher than 200kV in some countries in the 1980's,and has been widely applied in the European and American countries.It has also been applied in higher voltage power lines.

OPPC is deployed to replace one phase line to build up a three-phase power transmission system of two conductors and one OPPC.This offers an economical way to solve the problems of power automation,dispatching and telecommunication and greatly improve the quality and quantity of transmission without additional installation of telecommunication lines.

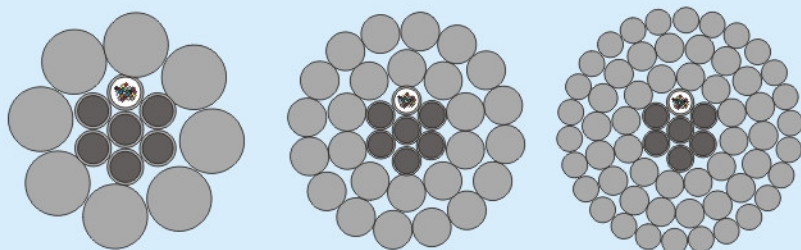
## Engineering Design and Installation

The engineering design of OPPC may adopt the specification of OPGW and three-phase conductor as a reference with regard to the sag, calculation of hanging point and drum length,as well as the span.

The installation of OPPC requires the separation of optical fiber unit from the operating phase line,which involves the technology of fiber splicing and optical-electric division and calls for strict requirements of jointing technique and high voltage insulation.

The closures for OPPC include the intermediate closure and the termination closure and are different from those deployed for other optical fiber cables.

At present our company has been in the 10kV, 35kV, 110kV, 220kV line linked to the success of network operation the number of lines, the long time has reached seven years.



OPPC与LGJ型号对照表

型号	标称截面 (铝/钢)	结构根数/直径 (mm)		计算截面 (mm <sup>2</sup> )			外径 (mm)	直流电阻 不大于 (Ω/Km)	计算拉 断力 (kN)	计算质量 (kg/km)
	mm <sup>2</sup>	铝	钢	铝	钢	总计				
JL/G1A-95/20	95/20	7/4.16	7/1.85	95.14	18.82	113.96	13.9	0.3020	37.24	408.2
OPPC-24B1-95/20	95/20	9/3.5	1/2.4LB20; 5/2.4LB27;	96.09	17.64	113.73	14.2	0.2936	38.68	418.6
JL/G1A-95/55	95/55	12/3.20	7/3.20	96.51	56.30	152.81	16.0	0.2992	77.85	706.1
OPPC-24B1-95/55	95/55	13/3.05	1/3.5LB20; 5/3.4LB20;	108.73	41.26	150.00	16.4	0.2541	80.2	652.2
JL/G1A-120/20	120/20	26/2.38	7/1.85	115.67	18.82	134.49	15.1	0.2496	42.26	466.1
OPPC-24B1-120/20	120/20	8/4.3	1/2.4LB20; 5/2.4LB20;	122.96	20.36	143.32	15.8	0.2301	51.2	515.8
JL/G1A-120/25	120/25	7/4.72	7/2.10	122.48	24.25	146.73	15.7	0.2346	47.96	525.7
OPPC-24B1-120/25	120/25	8/4.3	1/2.5LB20; 5/2.5LB20;	123.54	22.09	145.63	16.1	0.2287	53.90	532.0
JL/G1A-150/20	150/20	24/2.78	7/1.85	145.68	18.82	164.50	16.7	0.1981	46.78	548.5
OPPC-24B1-150/20	150/20	30/2.4	1/2.5LB27; 5/2.5LB27;	146.61	18.56	165.17	17.1	0.1942	47.31	566.8
JL/G1A-150/25	150/25	26/2.70	7/2.10	148.86	24.25	173.11	17.1	0.1940	53.67	600.1
OPPC-24B1-150/25	150/25	30/2.5	1/2.5LB23; 5/2.5LB23;	156.10	20.62	176.71	17.5	0.1824	54.63	609.5
JL/G1A-150/35	150/35	30/2.50	7/2.50	147.26	34.36	181.62	17.5	0.1962	64.94	675.0
OPPC-24B1-150/35	150/35	30/2.55	1/2.60LB14; 5/2.55LB14;	157.22	26.83	184.05	17.9	0.1803	69.25	660.9
JL/G1A-185/25	185/25	24/3.15	7/2.10	187.03	24.25	211.28	18.9	0.1543	59.23	704.9
OPPC-24B1-185/25	185/25	28/2.85	1/2.60LB23; 5/2.55LB23;	187.88	21.59	209.47	19.1	0.1519	60.40	704.2
JL/G1A-185/30	185/30	26/2.98	7/2.32	181.34	29.59	210.93	18.9	0.1592	64.56	731.4
OPPC-24B1-185/30	185/30	28/2.85	1/2.6LB20; 5/2.5LB20;	186.28	22.98	209.27	19.0	0.1530	67.14	714.1
JL/G1A-185/45	185/45	30/2.80	7/2.80	184.73	43.10	227.83	19.6	0.1564	80.54	846.7
OPPC-24B1-185/45	185/45	32/2.7	1/3.1LB20; 5/3.0LB20;	193.94	32.17	226.11	19.9	0.1463	82.62	812.4
JL/G1A-240/30	240/30	24/3.60	7/2.40	244.29	31.67	275.96	21.6	0.1181	75.19	920.7
OPPC-24B1-240/30	240/30	26/3.45	1/2.7LB20; 5/2.7LB20;	251.64	25.76	277.41	21.9	0.1136	81.33	918.3
JL/G1A-300/40	300/40	24/3.99	7/2.66	300.09	38.90	338.99	23.9	0.0961	92.36	1131.0
OPPC-24B1-300/40	300/40	26/3.8	1/3.0LB20; 5/3.0LB20;	305.47	31.81	337.28	24.2	0.0935	98.07	1118.0
JL/G1A-400/35	400/35	48/3.22	7/2.50	390.88	34.36	425.24	26.8	0.0739	103.67	1347.5
OPPC-24B1-400/35	400/35	54/3.0	1/3.1LB23; 5/3.0LB23;	394.57	30.02	424.59	27.1	0.0728	105.01	1350.6
JL/G1A-500/45	500/45	48/3.60	7/2.80	488.58	43.10	531.68	30.0	0.0591	127.31	1685.5
OPPC-24B1-500/45	500/45	54/3.35	1/3.4LB23; 5/3.35LB23;	491.91	37.20	529.11	30.2	0.0584	130.62	1680.4