CMA
2017000369Z

报 告 编 号
Reference № CT08-1260-1

检 验 报 告
Test Report

样 品 名 称 Name of sample	20/35kV Aluminum Conductor XLPE Insulated Cable
样 品 型 号 Type of sample	Al/XLPE/MDPE
委 托 方 Consigner	Hangzhou Easy Electric Wire And Cable Co.,LTD
检 验 类 别 Kind of test	Commission Test（Type test）

国家电线电缆质量监督检验中心 检验专用章

国家电线电缆质量监督检验中心

CHINA NATIONAL CENTRE FOR QUALITY
SUPERVISION AND TEST OF ELECTRIC WIRE AND CABLE

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China National Centre for Quality Supervision and Test of Electric Wire and Cable

Test Report

Type and size	Al/XLPE/MDPE 20/35kV 1x400		Reference No.	CT08-1260-1
Name of sample	20/35kV Aluminum Conductor XLPE Insulated Cable			
Kind of test	Commission Test (Type test)			
Consigner	Name	Hangzhou Easy Electric Wire And Cable Co.,LTD		
	Address	C508 Room,Virgo Building,Wuchang Xixi Software Park, Hangzhou,CHINA		
	Tel.	+86-0571-86160530	Fax	+86-0571-86160530
Manufacturer	Name	Hangzhou Easy Electric Wire And Cable Co.,LTD		
	Address	C508 Room,Virgo Building,Wuchang Xixi Software Park, Hangzhou,CHINA		
	Tel.	+86-0571-86160530	Fax	+86-0571-86160530
Test standard	Refer to IEC 60840:2004 Power cables with extruded insulation and their accessories for rated voltages from 30kV(Um=36kV) up to 150kV (Um=170kV) — Test methods and requirements			
Date of test	From Jun.3,2017 to Jul.5,2017			
Conclusion	The items tested comply with the requirements of IEC 60840:2004.			
Note	Impulse voltage value is 200kV specified by the manufacturer.			

Tested by	Zhu Yonghua	Checked by	Wang Shen	Approved by	Mao Axing

Type and Size	Al/XLPE/MDPE 20/35kV 1×400	Reference No.	CT08-1260-1

Cl.	Test Items	Unit	Requirements	Test Results	Verdict
1	Construction				
1.1	Conductor				
	-conductor material		Aluminum	Aluminum	P
	-No. of wires in conductor		min.53	61	P
1.2	Conductor screen				
	-average thickness	mm		0.85	N
	-minimum thickness	mm		0.81	N
1.3	Insulation				
	-average thickness	mm		9.4	N
	-minimum thickness(t_{min})	mm		9.07	N
	-(t_{max}-t_{min})/t_{max}		max.0.15	0.07	P
1.4	Insulation screen				
	-average thickness	mm		0.83	N
	-minimum thickness	mm		0.69	N
1.5	Metallic screen				
	-material			copper tape screen	N
	-layer/thickness/width	mm		1×0.13×30	N
	-overlap of copper tape	%		17	N
1.6	Sheath				
	-average thickness	mm		3.2	N
	-minimum thickness	mm		2.85	N
1.7	Overall diameter of cable	mm		52.6	N
2	Marking				
	-marking on the surface of completed cable			NINGBO KANGXING CABLE CO., Ltd 20/35kV XLPE/MDPE 1×400mm^2	N
	-distance between the end of marking and the beginning of the next	mm		470	N
3	Electrical properties				
3.1	Conductor resistance (20℃)	Ω/km	max.0.0778	0.0746	P

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Cl.	Test Items	Unit	Requirements	Test Results	Verdict
3.2	Bending test (bending diameter :20(D+d)±5%,and bending cycle shall be carried out three times) followed by partial discharge test —discharge at $1.5U_0$		No detectable discharge exceeding the declared sensitivity (5pC or better)	passed (sensitivity:2.3pC)	P
3.3	Tan δ measurement (95℃～100℃, U_0)		max.0.0010	0.0003	P
3.4	Heating cycle voltage test (20 times of the cycle shall be carried out, $2U_0$)		no breakdown	passed	P
3.5	Partial discharge test after Heating cycle voltage test - discharge at $1.5U_0$		No detectable discharge exceeding the declared sensitivity (5pC or better)	passed (sensitivity:2.6pC)	P
3.6	Lightning impulse voltage test (95℃～100℃,±200kV,10times)		no breakdown	passed	P
	followed by a power frequency voltage test ($2.5U_0$, 15min at room temp.)		no breakdown	passed	P
3.7	Examination of the cable with cable on completion of the above tests		The cable shall reveal no signs of deterioration which could affect the system in service operation.	passed	P
3.8	Resistivity of semi-conducting screen (measured at 90℃) without ageing				
	-conductor screen resistivity	Ω·m	max.1000	10.74	P
	-insulation screen resistivity	Ω·m	max.500	17.2	P
	After additional ageing on pieces of completed cable (100℃,168h)				
	-conductor screen resistivity	Ω·m	max.1000	18.52	P
	-insulation screen resistivity	Ω·m	max.500	42.9	P

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Cl.	Test Items	Unit	Requirements	Test Results	Verdict
4	Mechanical properties of insulation				
4.1	Without ageing				
	-tensile strength	N/mm^2	min.12.5	20.7	P
	-elongation at break	%	min.200	510	P
4.2	After ageing in air oven (135℃,168h)				
	-variation of tensile strength	%	max.±25	+23	P
	-variation of elongation at break	%	max.±25	+8	P
4.3	After additional ageing test on pieces of completed cable (100℃,168h)				
	-variation of tensile strength	%	max.±25	+8	P
	-variation of elongation at break	%	max.±25	+2	P
4.4	Hot set test (200℃,15min,20N/cm^2)				
	-elongation under load	%	max.175	73	P
	-permanent elongation after cooling	%	max.15	0	P
4.5	Heat shrinkage test (130℃,6h)				
	-shrinkage	%	max.4	0.5	P
5	Mechanical properties of sheath				
5.1	Without ageing				
	-tensile strength	N/mm^2	min.12.5	26.0	P
	-elongation at break	%	min.300	820	P

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Cl.	Test Items	Unit	Requirements	Test Results	Verdict
5.2	After ageing in air oven (110℃,240h)				
	-tensile strength	N/mm^2		31.2	N
	-elongation at break	%	min.300	920	P
5.3	After additional ageing test on pieces of completed cable (100℃,168h)				
	-tensile strength	N/mm^2		26.8	N
	-elongation at break	%	min.300	850	P
5.4	Pressure test at high temperature (110℃)				
	-depth of indentation	%	max.50	6	P
5.5	Carbon black content	%	2.5±0.5	2.6	P
5.6	Shrinkage test (80℃,5h, 5 cycles)				
	-shrinkage	%	max.3	1	P

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