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实验室名称: 国家电器产品质量监督检验中心

Lab Name: China National Center for Quality Supervision
and Test of Electrical Apparatus Products

No 19XJ0631-S

检验 (试验) 报告 Test Report

委托单位: ZHEJIANG HAIVO ELECTRICAL CO.,LTD.
Client:

产品名称: POLYMERIC STRAIN TYPE INSULATOR
Name of Product:

产品型号: FXB-24kV/70kN
Product Type:

检验类别: Type test
Test Category:



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China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
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China National Center for Quality Supervision and Test of Electrical Apparatus Products		Test Report		FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR	
General					
Test category		Type test			
Type and name of specimens		FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR			
Client		ZHEJIANG HAIVO ELECTRICAL CO.,LTD.			
Address		CHONGSHI INDUSTRIAL ZONE,PANSHI,YUEQING,ZHEJIANG,CHINA			
Manufacturer		ZHEJIANG HAIVO ELECTRICAL CO.,LTD.			
Address		CHONGSHI INDUSTRIAL ZONE,PANSHI,YUEQING,ZHEJIANG,CHINA			
Manufacturing date and serial number		/			
Main technical parameters of specimens	lightning-impulse withstand voltage kV peak		190		
	Wet Power-frequency withstand voltage kV		100		
	Specified mechanical load (SML) kN		70		
	Creepage distance mm		≥645		
Technical data from client	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR Test commission form				
	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR Assembly				
Description	/				
Representative of client: Gu Guangwei					
Date of specimens receiving: Aug. 8 th , 2019					
Test period: From Aug. 12 th , 2019 to Sep. 24 th , 2019					

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
Test conclusion		
Client	ZHEJIANG HAIVO ELECTRICAL CO.,LTD.	
Type of specimens	FXB-24kV/70kN	
Name of specimens	POLYMERIC STRAIN TYPE INSULATOR	
Manufacturer	ZHEJIANG HAIVO ELECTRICAL CO.,LTD.	
Test items and results	Visual examination	PASS
	Mechanical routine test[SML: 70kN]	PASS
	Tests on interfaces and connections of end fittings (precondition test)	PASS
	Tests on interfaces and connections of end fittings (reference dry power frequency test)	
	Tests on interfaces and connections of end fittings (sudden load release pre-stressing)	
	Tests on interfaces and connections of end fittings (thermal-mechanical pre-stressing)	
	Tests on interfaces and connections of end fittings (water immersion pre-stressing)	
	Tests on interfaces and connections of end fittings (visual examination)	
	Tests on interfaces and connections of end fittings (steep-front impulse voltage test)	
	Tests on interfaces and connections of end fittings (dry power-frequency voltage test)	
	Hardness test	
	Accelerated weathering test	PASS
	Tracking and erosion test[1000h]	PASS
	Flammability test [class V-0]	PASS
	Tests on the core material (dye penetration test)	PASS
	Tests on the core material (water diffusion test)	PASS
	Assembled core load-time test[SML: 70kN]	PASS
	Dry lightning impulse withstand voltage test [between upper and lower end surfaces: 190kV peak]	PASS
	Wet power-frequency test [between upper and lower end surfaces: 100kV/1min]	PASS
	Damage limit proof test and test of the tightness of the interface between end fittings and insulator housing	PASS
	Verification of dimensions[According to technical deta]	PASS
	Galvanizing test[Ontology:single average value $\geq 70\mu\text{m}$ and total average value $\geq 85\mu\text{m}$]	PASS
	Verification of the tightness of the interface between end fittings and insulator housing and verification of the specified mechanical load[SML: 70kN]	PASS
Test standard	IEC61109: 2008 Insulators for overhead lines – Composite suspension and tension insulators for a.c. systems with a nominal voltage greater than 1 000 V – Definitions, test methods and acceptance criteria	
Conclusion	The tests are carried out on FXB-24kV/70kNPOLYMERIC STRAIN TYPE INSULATOR by ZHEJIANG HAIVO ELECTRICAL CO., LTD., and the test items meet the relevant clauses of above test standards and technical specification, and the specimens have passed the tests. Note: the conclusion is valid only for the inspected and tested specimens.	
Compiled by: 宋文平	Proofread by: 陈政	Checked by: 张俊
Date: 2019-11-18	Date: 2019-11-18	Date: 2019-11-18
Approved by: 1 李俊		Date: 2019-11-18

China National Center for
Quality Supervision and Test of
Electrical Apparatus Products

Test Report

FXB-24kV/70kN
POLYMERIC STRAIN TYPE
INSULATOR

Visual examination

Test date: 2019-08-12

1. Test result

No. of the specimens	Appearance inspection standard of test specimen	Test result
19XJ0631-S-#01~#22	Each insulator shall be examined. The mounting of metallic parts on the insulator assembly shall be in accordance with the drawings. The colour of the insulator shall approximately be as specified in the drawing. The following defects are not permitted: Superficial defects of an area greater than 25 mm² (the total defective area not to exceed 0,2 % of the total insulator surface) or depth or height greater than 1 mm; Crack at the root of the shed notably next to the metal fittings; Separation or lack of bonding at the housing to metal fitting joint (if applicable); Separation or bonding defects at the shed to sheath interface(if applicable); Moulding flashes protruding more than 1 mm above the housing surface.	Meet the requirements
Note: /		

Test Report

FXB-24kV/70kN
POLYMERIC STRAIN TYPE
INSULATOR

Mechanical routine test

Test date: 2019-08-12

I. Test result

No. of the specimens	Applied mechanical loads(kN)	Duration (min)	Whether damaged
19XJ0631-S-#01	36.12	10	No
19XJ0631-S-#02	35.55		
19XJ0631-S-#03	35.56		
19XJ0631-S-#04	35.60		
19XJ0631-S-#05	35.37		
19XJ0631-S-#06	35.31		
19XJ0631-S-#07	35.46		
19XJ0631-S-#08	35.39		
19XJ0631-S-#09	35.28		
19XJ0631-S-#10	35.29		
19XJ0631-S-#11	35.27		
19XJ0631-S-#12	35.76		
19XJ0631-S-#13	35.78		
19XJ0631-S-#14	35.80		
19XJ0631-S-#15	35.36		
19XJ0631-S-#16	35.40		
19XJ0631-S-#17	35.39		
19XJ0631-S-#18	35.18		
19XJ0631-S-#19	35.16		
19XJ0631-S-#20	35.27		
19XJ0631-S-#21	35.28		
19XJ0631-S-#22	35.34		

Note: /

Report No.: 19XJ0631-S

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Test Report

FXB-24kV/70kN
POLYMERIC STRAIN TYPE
INSULATOR

Tests on interfaces and connections of end fittings (precondition test)

Test date: 2019-08-12

1. Test result

No. of the specimens	Appearance inspection standard of test specimen	Test result
19XJ0631-S-#01~#03	Three insulators assembled on the production line shall be used for tests on interfaces and connections of end fittings. Both end fittings shall be the same as on standard production insulators. The end fittings shall be assembled so that the insulating part from the fitting to the closest shed shall be identical to that of the production line insulator.	Meet the requirements

Note: /

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
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Tests on interfaces and connections of end fittings (reference dry power frequency test)

Test date: 2019-08-19

1. Test results:

No. of the specimens	Status of the specimen or test part	Dry power-frequency flashover withstand voltage (kV)					Average value	Corrected value	Duration (min)	Puncture Times
		1	2	3	4	5				
19XJ0631 -S-#01	Between upper and lower end surfaces of the insulators	140.6	142.7	139.6	139.9	140.4	140.6	132.5	1	0
19XJ0631 -S-#02		143.1	140.4	138.7	141.5	140.9	140.9	132.8	1	0
19XJ0631 -S-#03		138.3	140.1	140.5	140.7	141.3	140.2	132.2	1	0

Note: the data in the table has been corrected in the standard atmosphere condition.

Atmosphere condition of test zone	P=100.5kPa; Environmental temperature t=28.5℃; Relative humidity:72% Atmosphere correction factor Kt=1.0609/1.0612/1.0605 Height correction factor Ka= /
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China National Center for
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Test Report

FXB-24kV/70kN
POLYMERIC STRAIN TYPE
INSULATOR

Tests on interfaces and connections of end fittings (Sudden load release pre-stressing)

Test date: 2019-08-12

1. Test requirement:

With the insulator at $-20\text{ }^{\circ}\text{C}$ to $-25\text{ }^{\circ}\text{C}$, every test specimen is subjected to five sudden load releases from a tensile load amounting to 30 % of the SML.

Specified mechanical load SML: 70kN

2. Test results

No. of the specimens	Test temperature ($^{\circ}\text{C}$)	Applied tensile load (kN)	Broken or not
19XJ0631-S-#01~#03	-21.3	21.01	Not
	-22.0	21.01	Not
	-21.5	21.00	Not
	-22.5	21.05	Not
	-21.5	21.03	Not

Note: /

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR					
Tests on interfaces and connections of end fittings (Thermal-mechanical pre-stressing)							
Test date: 2019-08-12~2019-08-16							
1. Test requirement:							
Before commencing the test, the specimens shall be loaded at the ambient temperature by at least 5 % of the SML for 1 min, during which the length of the specimens shall be measured to an accuracy of 0.5 mm. This length shall be considered to be the reference length. The specimens are then submitted to temperature cycles under a continuous mechanical load, the 24h temperature cycle being performed four times. Each 24h cycle has two temperature levels with a duration of at least 8 h, one at $(+50 \pm 5) ^\circ\text{C}$, the other at $(-35 \pm 5) ^\circ\text{C}$. The cold period shall be at a temperature at least 85 K below the value actually applied in the hot period. The pre-stressing can be conducted in air or any other suitable medium. The applied mechanical load shall be equal to the RTL (at least 50 % of the SML) of the specimen. The specimen shall be loaded at ambient temperature before beginning the first thermal cycle. After the test, the length shall again be measured in a similar manner at the same load and at the original specimen temperature. Specified mechanical load SML: 70kN							
2. Test results							
No. of the specimens	Length of specimens (mm)	Applied tensile load (kN)	Cooling temperature ($^\circ\text{C}$)	Heating temperature ($^\circ\text{C}$)	Duration in cold or hot water (h)	Reversed times in 24h (times)	Length of specimens after test (mm)
19XJ0631-S-#01	485	35.04	-35.1	50.1	8	4	485
19XJ0631-S-#02	486	35.04	-35.1	50.1	8	4	486
19XJ0631-S-#03	485	35.04	-35.1	50.1	8	4	486
Note: /							

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR	
Tests on interfaces and connections of end fittings (Water immersion pre-stressing)			
Test date: 2019-08-16~2019-08-18			
1. Test results:			
No. of the specimens	Test liquor	Boiling time (h)	Whether cracks occur
19XJ0631-S-#01	Boiling deionized water with 0.1 % by weight of NaCl	42	No
19XJ0631-S-#02	Boiling deionized water with 0.1 % by weight of NaCl	42	No
19XJ0631-S-#03	Boiling deionized water with 0.1 % by weight of NaCl	42	No
Note: /			

China National Center for
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Test Report

FXB-24kV/70kN
POLYMERIC STRAIN TYPE
INSULATOR

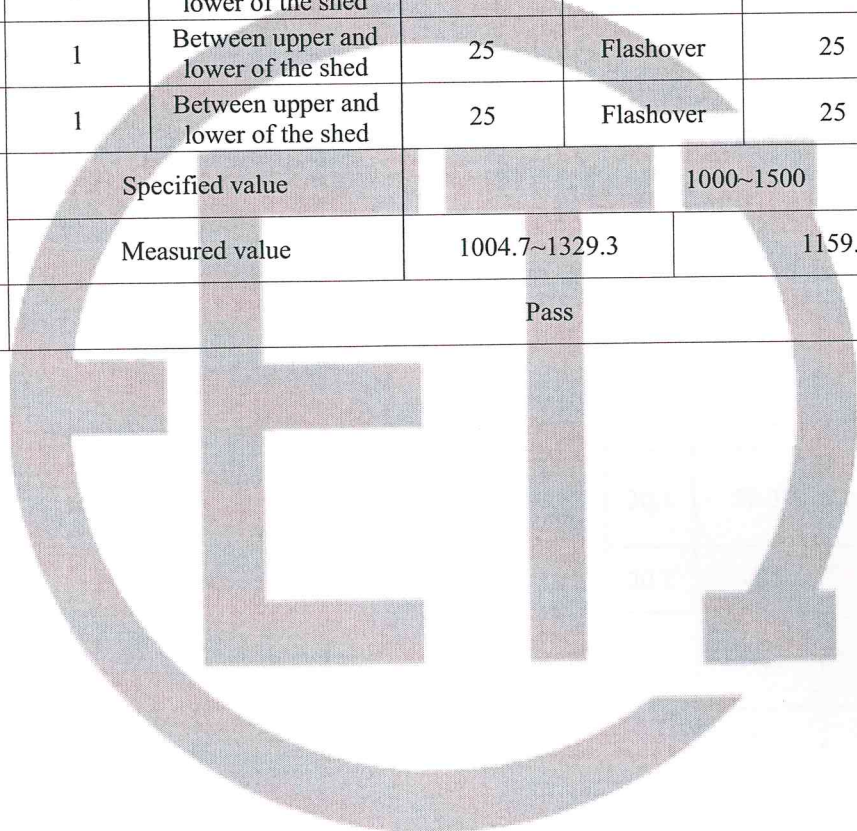
Tests on interfaces and connections of end fittings (Visual examination)

Test date: 2019-08-18

1. Test result

No. of the specimens	Appearance inspection standard of test specimen	Test result
19XJ0631-S-#01~#03	After water immersion pre-stressing the housing of each specimen is inspected visually. No cracks are permissible.	Meet the requirements

Note: /

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report		FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR							
Tests on interfaces and connections of end fittings (Steep-front impulse voltage test)										
Test date: 2019-08-19										
1. Test results:										
No. of the specimens	Specimen section	Status of the specimen or test part	Positive polarity		Negative polarity					
			Impulses in each section	Flashover or puncture	Impulses in each section	Flashover or puncture				
19XJ0631-S-#01	1	Between upper and lower of the shed	25	Flashover	25	Flashover				
19XJ0631-S-#02	1	Between upper and lower of the shed	25	Flashover	25	Flashover				
19XJ0631-S-#03	1	Between upper and lower of the shed	25	Flashover	25	Flashover				
Steepness kV/ μ s	Specified value		1000~1500							
	Measured value		1004.7~1329.3		1159.6~1300.8					
Conclusion	Pass									
										
Atmosphere condition of test zone	P=101.1kPa; Environmental temperature t=30.4℃; Relative humidity:63% Atmosphere correction factor Kt= / Height correction factor Ka= /									

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
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Tests on interfaces and connections of end fittings (Dry power-frequency voltage test)

Test date: 2019-08-19

1. Test results:

No. of the specimens	Status of the specimen or test part	Dry power-frequency flashover withstand voltage (kV)					Average value	Corrected value	Duration (min)	Times of puncture
		1	2	3	4	5				
19XJ0631-S-#01	Between upper and lower end surfaces of the insulator	135.8	133.6	134.5	135.0	132.3	134.2	130.2	1	0
19XJ0631-S-#02		134.5	135.8	133.9	134.6	134.0	134.6	130.5	1	0
19XJ0631-S-#03		132.5	135.9	133.4	134.0	135.0	134.1	130.1	1	0

2. Conclusion: The values of flashover voltage of Specimens No.19XJ0631-S-#01~#03 exceed 90% of based flashover voltage and the test is passed.

No. of the specimens	80% based flashover voltage (kV)	Duration (min)	Measured points						Results
			Applied points	1	2	3	Average value	Temperature rise(<10K)	
19XJ0631-S-#01	107.4	30	Refer to bar temperature (°C)	30.2	30.1	30.2	30.2	0.1	Pass
			Temperature after raising voltage (°C)	30.4	30.2	30.3	30.3		
19XJ0631-S-#02	107.6	30	Refer to bar temperature (°C)	30.2	30.3	30.2	30.2	0.2	Pass
			Temperature after raising voltage (°C)	30.4	30.5	30.3	30.4		
19XJ0631-S-#03	107.2	30	Refer to bar temperature (°C)	30.0	30.1	30.0	30.0	0.3	Pass
			Temperature after raising voltage (°C)	30.3	30.2	30.4	30.3		

Note: based flashover voltage refers to dry power-frequency flashover withstand voltage of specimen 19XJ0631-S-#01~#03. See page 8

Note: the data in the table has been corrected in the standard atmosphere condition.

Atmosphere condition of test zone	P=103.2kPa; Environmental temperature t=25.0°C; Relative humidity:61% Atmosphere correction factor Kt= 1.0309/1.0311/1.0308 Height correction factor Ka= /
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China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report				FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR							
Hardness test												
Test date: 2019-08-15~2019-08-17												
1. Test results:												
No. of the specimens	Ambient temperature (℃)	Hardness				Boiling time (h)	Temperature after boiling (℃)	Hardness after boiling				Changement from the pre-boiled value <20%
		1	2	3	The mid- value			1	2	3	The mid- value	
19XJ0631-S-C01	27.8	54.6	55.2	55.0	55.0	42	29.3	52.4	51.8	54.6	52.4	4.73
19XJ0631-S-C02	27.8	55.6	56.0	57.2	56.0	42	29.3	53.0	54.2	55.2	54.2	3.21
2. Conclusion: Pass												
Note: /												

China National Center for
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Electrical Apparatus Products

Test Report

FXB-24kV/70kN
POLYMERIC STRAIN TYPE
INSULATOR

Accelerated weathering test

Test date: 2019-08-12~2019-09-23

1. Test results:

No. of the specimens	The temperature of blackboard		Radiancy W/m ²	Duration (h)	Test results
	Required value	Set value			
17XJ0574-S-C03				1000	Markings on shed or housing material shall be legible; there are no surface degradations such as cracks and raised areas
17XJ0574-S-C04	65°C±3K	65.3°C	550	1000	Markings on shed or housing material shall be legible; there are no surface degradations such as cracks and raised areas
17XJ0574-S-C05				1000	Markings on shed or housing material shall be legible; there are no surface degradations such as cracks and raised areas

2. Conclusion: Pass

Note: test method: UV light test

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
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Tracking and erosion test

Test date: 2019-08-13~2019-09-24

1. Test result:

No. of the specimens	Applied voltage (kV)	Creepage distance (mm)	Duration (h)	Times of flashover	Times of interruption	Depth of erosion (mm)	
						Specified value	Measured value
19XJ0631-S- #04	19.95	690	1000	0	0	<3	<0.5
19XJ0631-S- #05	19.95	690	1000	0	0	<3	<0.5

After test the erosion depth does not reach the galvanized base. Corrosion resistance meets the requirement. The test is passed.

Note: Water velocity: $0.30\text{L}/(\text{m}^3\cdot\text{h})$; Fog house temperature: 20.0°C ; Concentration of NaCl in water: $8.0\text{ kg}/\text{m}^3$; Settlement: $1.6\text{mL}/(80\text{cm}^2\cdot\text{h})$. 19XJ0631-S-#04 is tested mounted horizontally and 19XJ0631-S-#05 is tested mounted vertically.

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
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Flammability test

Test date: 2019-08-14~2019-08-21

1. Test results:

No. of the specimens	First ignition time (s)	t ₁ (s)	Second ignition time (s)	t ₂ (s)	t ₃ (s)	Individual test specimen afterflame time plus afterglow time after thesecond flame application (t ₂ +t ₃) (s)	Total afterflame time tf (s)
19XJ0631-S-C06	10	0	10	0	0	0	0
19XJ0631-S-C07	10	0	10	0	0	0	
19XJ0631-S-C08	10	0	10	0	0	0	
19XJ0631-S-C09	10	0	10	0	0	0	
19XJ0631-S-C10	10	0	10	0	0	0	
19XJ0631-S-C16	10	0	10	0	0	0	0
19XJ0631-S-C17	10	0	10	0	0	0	
19XJ0631-S-C18	10	0	10	0	0	0	
19XJ0631-S-C19	10	0	10	0	0	0	
19XJ0631-S-C20	10	0	10	0	0	0	

Afterflame and/or afterglow of any specimen does not burned to the holding clamp and cotton indicator pad does not ignited by flaming particles or drops.

2. Conclusion: materials passing V-0

Note: specimens No. 19XJ0631-S-C06-C15 have preprocessed under temperature of 22.8°C~24.3°C and humidity of 51%~54% for 48h; specimen No. 19XJ0631-S-C16-C25 have preprocessed under temperature of 70°C for 168h.

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
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Tests on the core material (Dye penetration test)

Test date: 2019-08-20

1. Test results:

No. of the specimens	Test liquor	Diameter of steel ball mm	The level which is higher than the level of the balls mm	Length of specimens mm	Time which dye rises through the specimens Specified value min	Time which dye rises through the specimens Measured value min
19XJ0631-S-B01	1% magenta alcohol solution	2.0	2.0	10.16	> 15	30
19XJ0631-S-B02		2.0	2.0	10.09	> 15	29
19XJ0631-S-B03		2.0	2.0	10.05	> 15	28
19XJ0631-S-B04		2.0	2.0	10.11	> 15	30
19XJ0631-S-B05		2.0	2.0	10.08	> 15	31
19XJ0631-S-B06		2.0	2.0	10.07	> 15	30
19XJ0631-S-B07		2.0	2.0	10.12	> 15	29
19XJ0631-S-B08		2.0	2.0	10.11	> 15	30
19XJ0631-S-B09		2.0	2.0	10.08	> 15	29
19XJ0631-S-B10		2.0	2.0	10.01	> 15	29

2. Conclusion: Pass

Note: /

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report		FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR				
Tests on the core material (Water diffusion test)							
Test date: 2019-08-15~2019-08-20							
1. Test requirements							
Six specimens shall be cut from a production line insulator making the cut approximately 90° to the long axis of the insulator with a diamond-coated circular saw blade under running cold water. The length of the specimens h shall be 30 mm±0,5 mm. The cut surfaces shall be smoothed by means of fine abrasive cloth (grain size 180). The cut ends shall be clean and parallel. The surfaces of the specimens shall be cleaned with isopropyl-alcohol and filter-paper immediately before boiling. The specimens shall be boiled in a glass container for 100 h±0,5 h in deionised water with 0,1 % by weight of NaCl. Specimens of only one core material shall be boiled together in the same container. After boiling, the specimens shall be removed from the boiling container and placed in another glass container filled with tap water at ambient temperature for at least 15 min. The voltage test shall be carried out within the next 3 h after the removal of the specimens from the boiling container. Immediately before the voltage test, the specimens shall be removed from the container and their surfaces dried with filter paper. Each specimen shall then be put between the electrodes. The test voltage shall be increased at approximately 1 kV per second up to 12 kV. The voltage shall be kept constant at 12 kV for 1 min and then decreased to zero. During the test no puncture or surface flashover shall occur. The current during the whole test shall not exceed 100µA (r.m.s.).							
2. Test results:							
No. of the specimens	The length of the specimens (mm)	Boiling time (h)	Whether damaged	Applied voltage (kV)	Duration (min)	Leakage current (mA)	Results
19XJ0631-S-B11	29.79	100	No	12.1	1	42	No puncture and surface flashover occurs
19XJ0631-S-B12	29.91	100	No	12.0	1	42	No puncture and surface flashover occurs
19XJ0631-S-B13	30.11	100	No	12.0	1	45	No puncture and surface flashover occurs
19XJ0631-S-B14	30.10	100	No	12.0	1	42	No puncture and surface flashover occurs
19XJ0631-S-B15	30.08	100	No	12.0	1	42	No puncture and surface flashover occurs
19XJ0631-S-B16	29.99	100	No	12.1	1	42	No puncture and surface flashover occurs
3. Conclusion: Pass							
Note: /							

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report		FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR	
Assembled core load-time test				
Test date: 2019-08-14~2019-08-20				
1. Test requirements				
1. Determination of the average failing load of the core of the assembled insulator M_{AV} Three of the specimens shall be subjected to a tensile load. The tensile load shall be increased rapidly but smoothly from zero to approximately 75 % of the expected mechanical failing load and shall then be gradually increased in a time between 30 s and 90 s until breakage of the core or complete pull-out occurs. The average of the three failing loads M_{AV} shall be calculated. 2. Verification of the 96 h withstand load Three specimens shall be subjected to a tensile load. The tensile load shall be increased rapidly but smoothly from zero up to 60 % of M_{AV}, and then maintained at this value for 96 h without Failing (breakage or complete pull-out). If for any reason the load application is interrupted, then the test shall be restarted on a new specimen. Specified mechanical load SML: 70kN				
2. Test results of determination of the average failing load of the core of the assembled insulator M_{AV}				
No. of the specimens	75%SML (kN)	Time form 75% STL to failure (s)	Failing load (kN)	The average failing load M_{AV} (kN)
19XJ0631-S-#06	52.53	148	104.45	108.16
19XJ0631-S-#07	52.51	169	111.59	
19XJ0631-S-#08	52.53	160	108.44	
3. Verification of the 96 h withstand load				
No. of the specimens	60% M_{AV} (kN)	Duration (h)	Whether damaged	
19XJ0631-S-#09	64.90	96	No	
19XJ0631-S-#10		96	No	
19XJ0631-S-#11		96	No	
4. Conclusion: Pass				
Note: /				

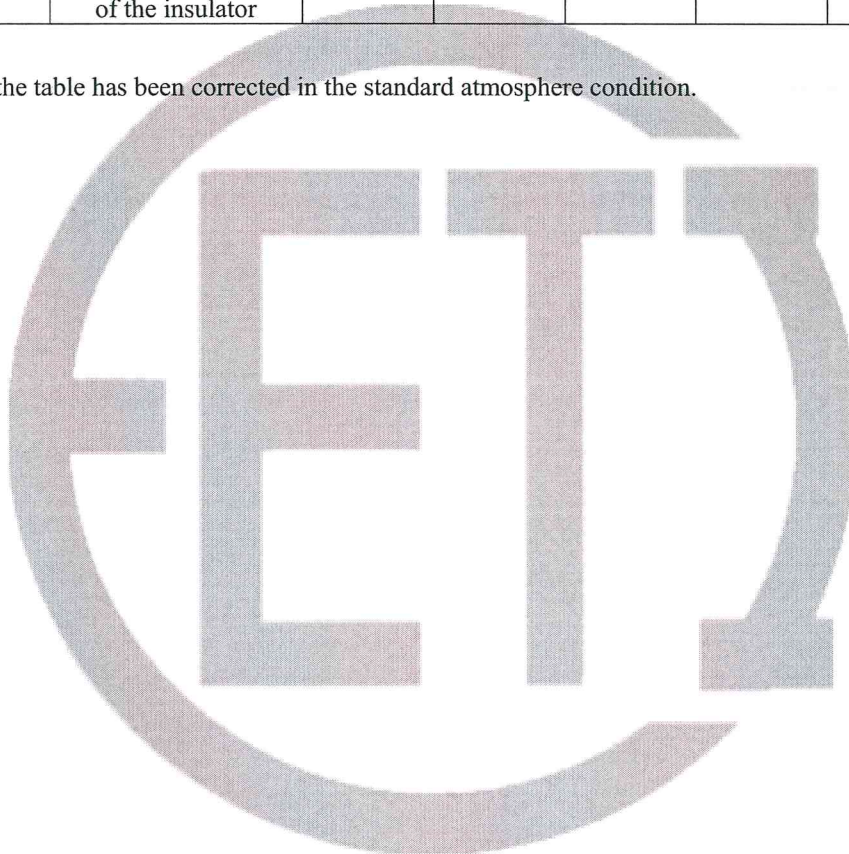
China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
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Dry lightning impulse withstand voltage test

Test date: 2019-08-13

No. of the specimen	Status of the specimen or test part	Positive polarity			Negative polarity		
		Voltage (kV)	Applied times	Puncture times	Voltage (kV)	Applied times	Puncture times
19XJ0631-S-#16	Between upper and lower end surfaces of the insulator	190.3	15	0	190.3	15	0

Note: the data in the table has been corrected in the standard atmosphere condition.



Atmosphere condition of test zone	P=103.2kPa; Environmental temperature t=25℃; Relative humidity:61% Atmosphere correction factor Kt=1.0017 Height correction factor Ka= /
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China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR		
Wet power-frequency test				
Test date: 2019-08-13				
Average sprinkling rate	Horizontal component: 1.56mm/min Vertical component: 1.51mm/min	Conductance ratio: 98.6 μ S/cm	Water temperature: 23.8°C	
No. of the specimen	Status of the specimen or test part	Power-frequency withstand voltage (Wet)		
		Voltage (kV)	Duration (s)	Puncture times
19XJ0631-S-#16	Between upper and lower end surfaces of the insulator	100.1	60	0
Note: the data in the table has been corrected in the standard atmosphere condition.				
Atmosphere condition of test zone	P=103.2kPa; Environmental temperature t=25°C; Relative humidity:61% Atmosphere correction factor Kt=1.0007 Height correction factor Ka= /			

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR				
Damage limit proof test and test of the tightness of the interface between end fittings and insulator housing						
Test date: 2019-08-12~2019-08-16						
1. Test results:						
a. The four specimens are subjected to a tensile load applied between the couplings at ambient temperature. The tensile load shall be increased rapidly but smoothly from zero up to 70 % of the SML (49kN) and then maintained at this value for 96 h.						
No. of the specimens	70%SML (kN)	Duration (h)				
19XJ0631-S-#12	49.13	96				
19XJ0631-S-#13	49.13	96				
19XJ0631-S-#14	49.13	96				
19XJ0631-S-#15	49.13	96				
b. At the end of the 96 h test 96h, both ends of specimen 19XJ0631-S-#12 shall be subjected to crack indication by dye penetration:						
No. of the specimen	Duration of penetrant applied on the cleaned surface (min)	Whether there are cracks visible				
19XJ0631-S-#12	20	No				
c. The three remaining specimens are then again subjected to a tensile load applied between the couplings at ambient temperature. The results as following:						
No. of the specimens	75%SML (kN)	Time form 75% SML to SML (s)	SML (kN)	Duration (s)	Failing load (kN)	Fail Status
19XJ0631-S-#13	52.50	50	70.02	40	99.91	Separation
19XJ0631-S-#14	52.51	49	70.03	41	104.23	Separation
19XJ0631-S-#15	52.52	50	70.02	40	103.85	Separation
2. Conclusion: Pass						
Note: /						

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
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Galvanizing test

Test date: 2019-08-12

1. Test result

Unit: μm

Times/Thickness		1	2	3	4	5	6	7	8	9	10	Single average value	Required value
No. of the specimens													
Upper end	19XJ0631-S-#20	127.1	108.2	100.5	96.0	95.5	93.4	102.0	95.3	104.5	86.1	100.9	≥ 70
	19XJ0631-S-#21	92.5	105.3	108.7	121.3	100.0	106.1	115.3	121.2	104.8	104.3	108.0	≥ 70
	19XJ0631-S-#22	103.4	87.6	99.6	120.6	109.7	109.0	109.5	105.0	111.6	98.2	105.4	≥ 70
Lower end	19XJ0631-S-#20	109.8	108.7	115.4	111.8	118.3	104.0	112.6	106.3	107.9	105.8	110.1	≥ 70
	19XJ0631-S-#21	129.7	104.7	109.2	104.3	111.2	113.2	123.6	119.1	110.0	125.0	115.0	≥ 70
	19XJ0631-S-#22	116.7	116.2	107.3	115.1	107.8	112.0	115.8	106.8	117.6	104.1	111.9	≥ 70
Total average value		Required total average value ≥ 85 , Actual total average value: 108.5											

2. Conclusion: The coating is continuous, uniform and smooth. The coating is sufficiently adherent to withstand handling consistent with the normal use of the article, without peeling or flaking. It meets the requirements and the test is passed.

Note: /

China National Center for Quality Supervision and Test of Electrical Apparatus Products	Test Report	FXB-24kV/70kN POLYMERIC STRAIN TYPE INSULATOR
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**Verification of the tightness of the interface between end fittings and insulator housing and
verification of the specified mechanical load**

Test date: 2019-08-12

1. Test result

- a. One insulator, No.19XJ0631-S-#20 (selected randomly from the specimen E2), shall be subjected to crack indication by dye penetration, in accordance with ISO 3452, on the housing in the zone embracing the complete length of the interface between the housing and metal fitting and including an additional area, sufficiently extended, beyond the end of the metal part. After test no cracks are indicated. Within 5 min after the application of the penetrant, the insulator shall be subjected, at the ambient temperature, to a tensile load of 70 % of the SML, applied between the metal fittings; the tensile load shall be increased rapidly but smoothly from zero up to 70 % of the SML, and then maintained at this value for 1 min

No. of the specimen	Duration of penetrant applied on the cleaned surface (min)	Whether there are cracks visible	70%SML (kN)	Duration (s)	Whether damaged
19XJ0631-S-#20	20	No	49.81	60	No

- b. The insulators of the specimen E1 shall be subjected at ambient temperature to a tensile load, applied between the couplings:

No. of the specimens	75% SML (kN)	Time form 75% STL to SML (s)	SML (kN)	Duration (s)	Whether damaged
19XJ0631-S-#16	52.57	50	70.31	40	No
19XJ0631-S-#17	52.56	50	70.26	40	No
19XJ0631-S-#18	52.53	50	70.28	40	No
19XJ0631-S-#19	52.56	50	70.31	40	No

2. Conclusion: Pass

Note: /

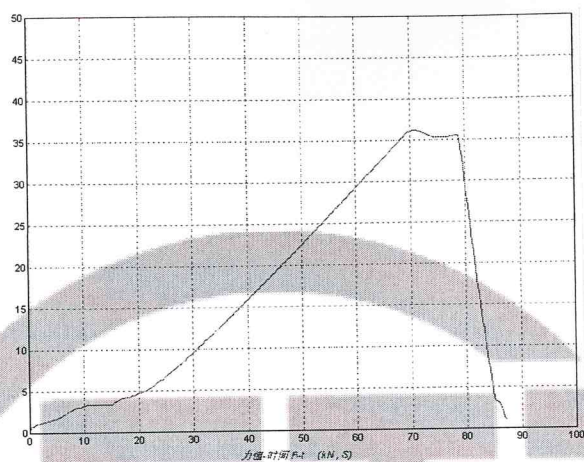
SJJJ-GT009

Oscillogram of mechanical routine test

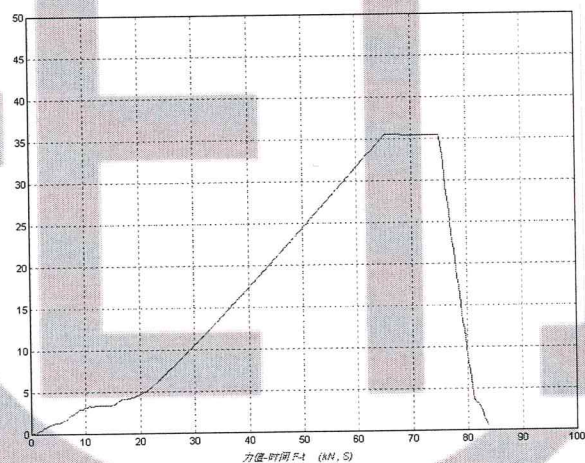
FXB-24kV/70kN
POLYMERIC STRAIN TYPE INSULATOR

No.: /

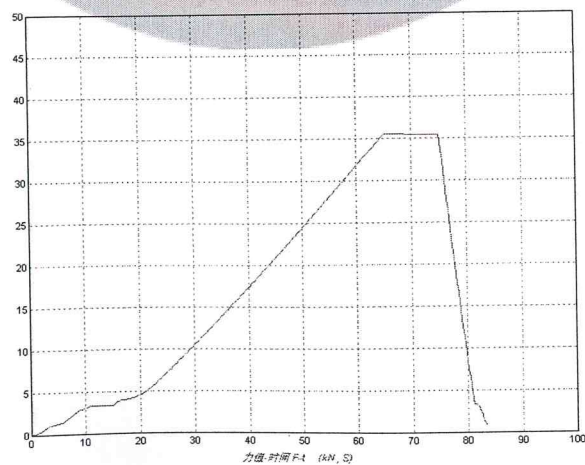
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19XJ0631-S-#02



19XJ0631-S-#03



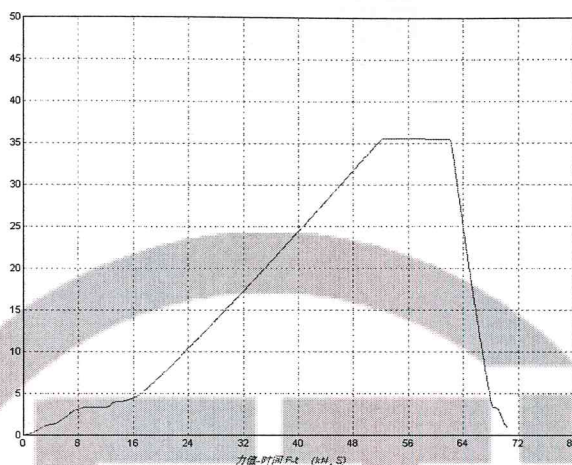
Oscillogram of mechanical routine test

FXB-24kV/70kN

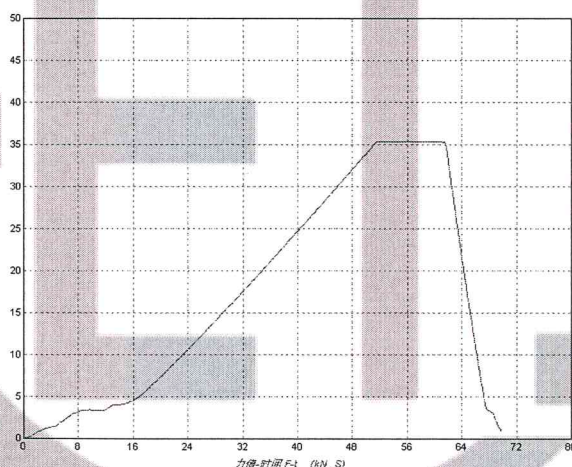
POLYMERIC STRAIN TYPE INSULATOR

No.: /

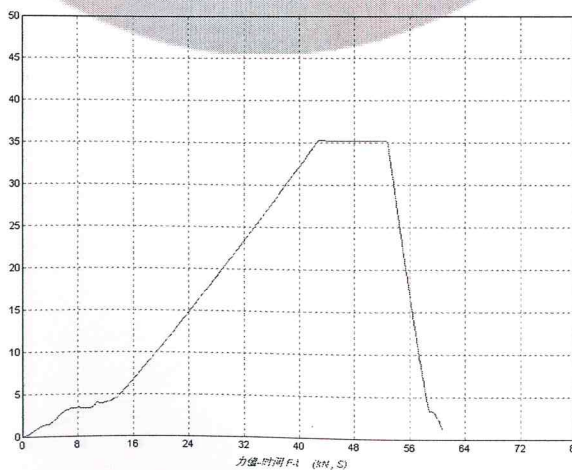
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19XJ0631-S-#05



19XJ0631-S-#06



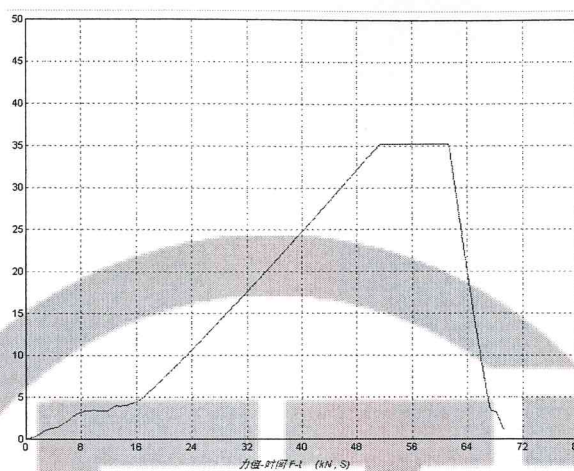
Oscillogram of mechanical routine test

FXB-24kV/70kN

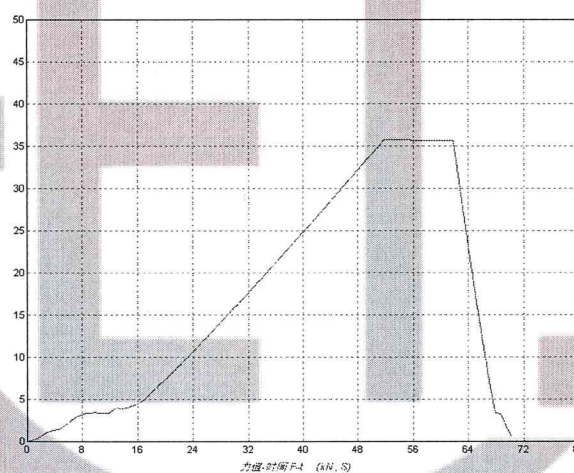
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No.: /

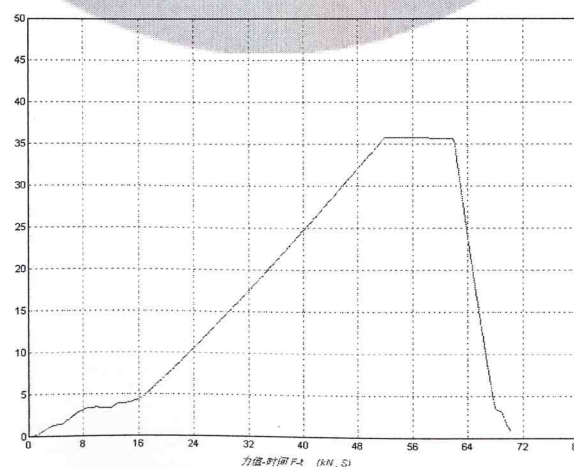
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19XJ0631-S-#08



19XJ0631-S-#09



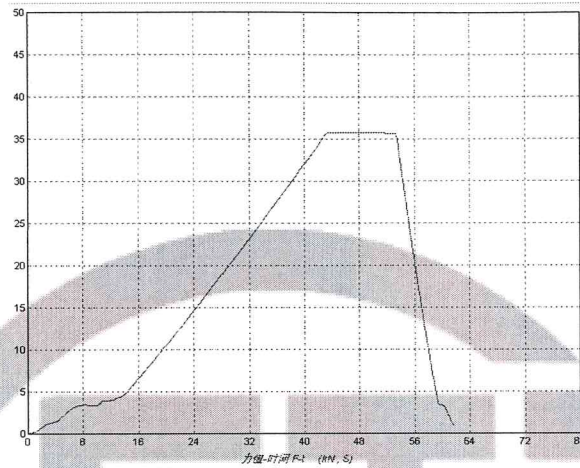
Oscillogram of mechanical routine test

FXB-24kV/70kN

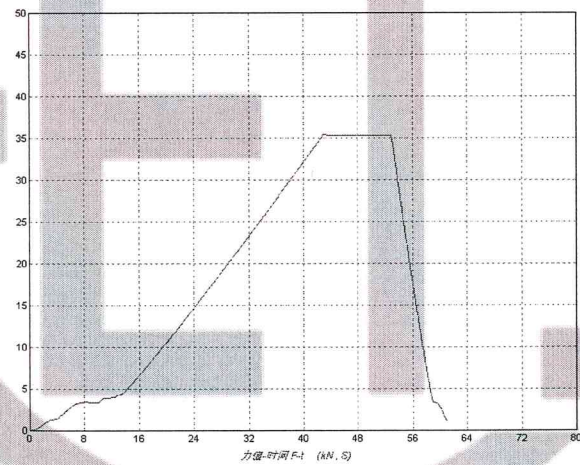
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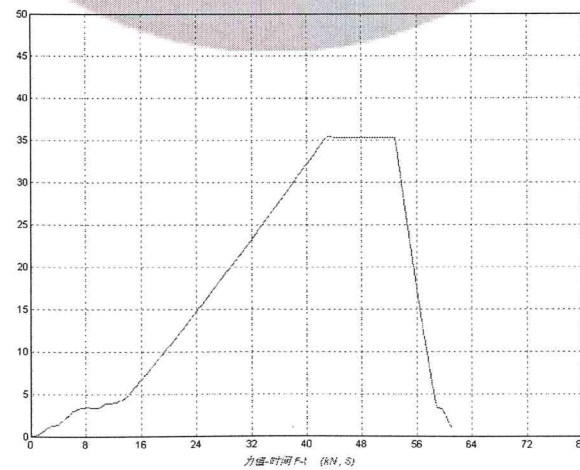
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19XJ0631-S-#11



19XJ0631-S-#12



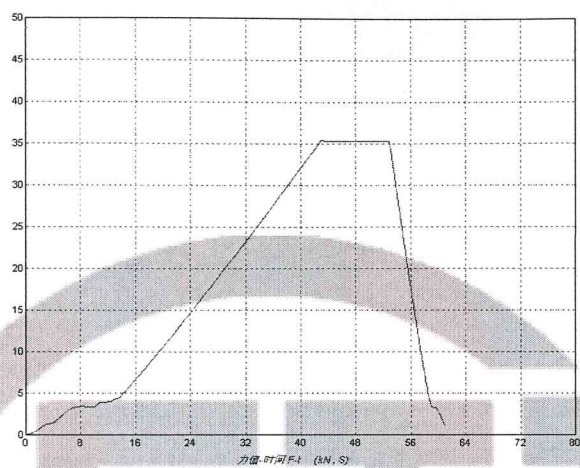
Oscillogram of mechanical routine test

FXB-24kV/70kN

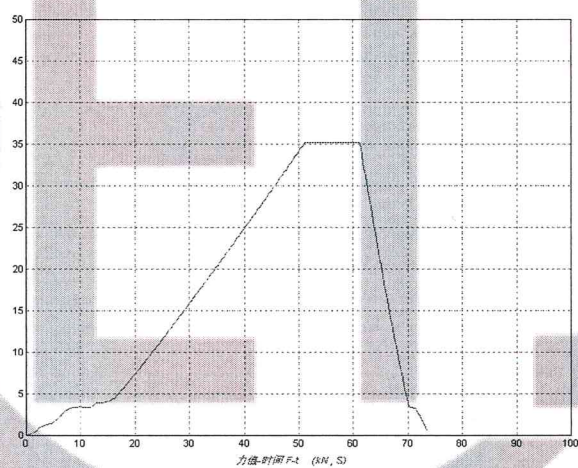
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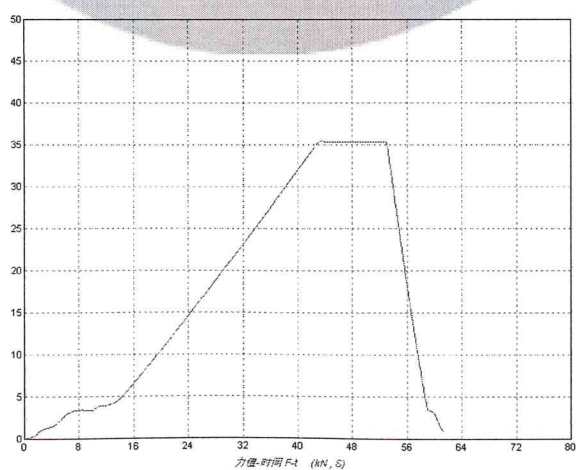
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19XJ0631-S-#14



19XJ0631-S-#15



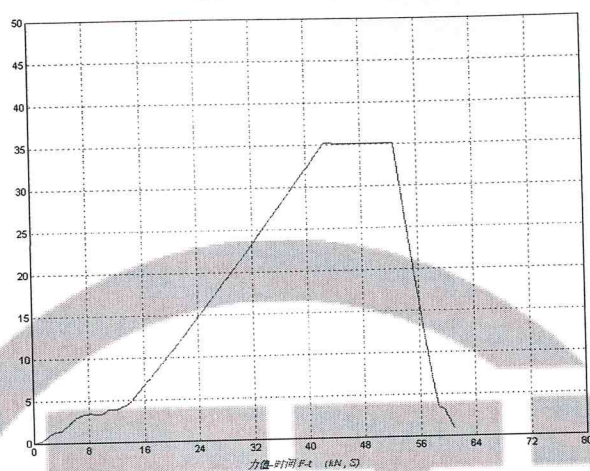
Oscillogram of mechanical routine test

FXB-24kV/70kN

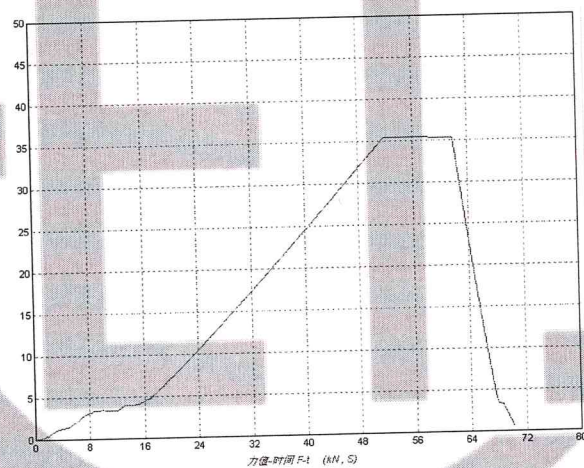
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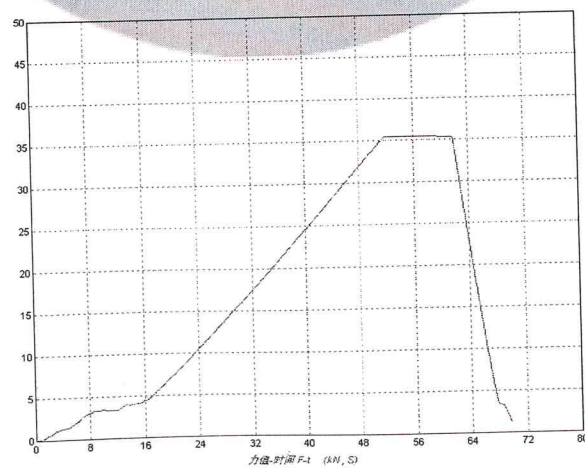
19XJ0631-S-#16



19XJ0631-S-#17



19XJ0631-S-#18



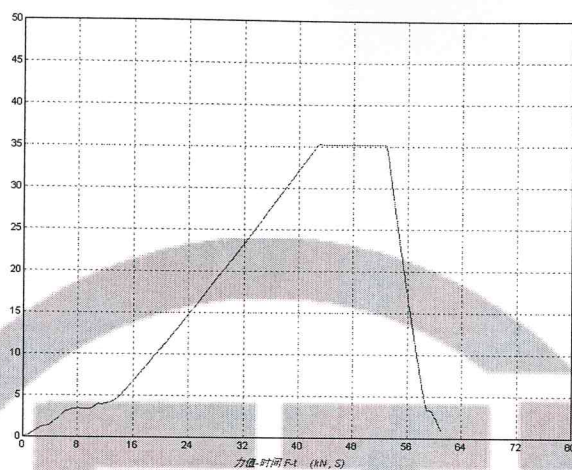
Oscillogram of mechanical routine test

FXB-24kV/70kN

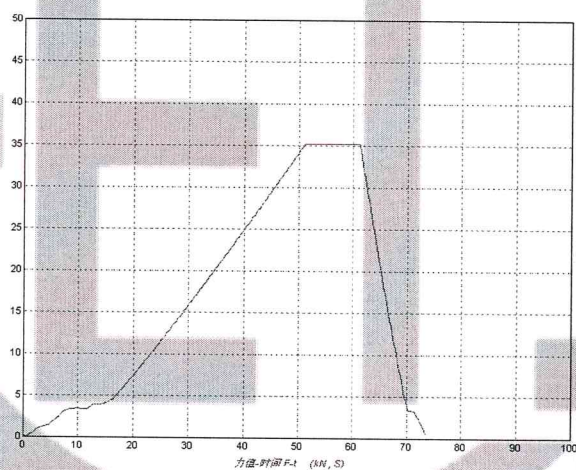
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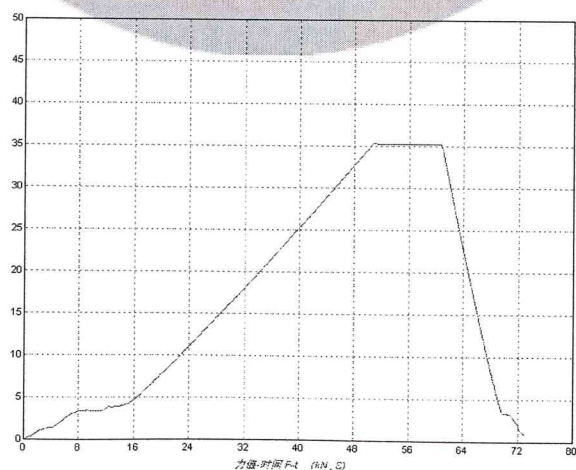
19XJ0631-S-#19



19XJ0631-S-#20



19XJ0631-S-#21



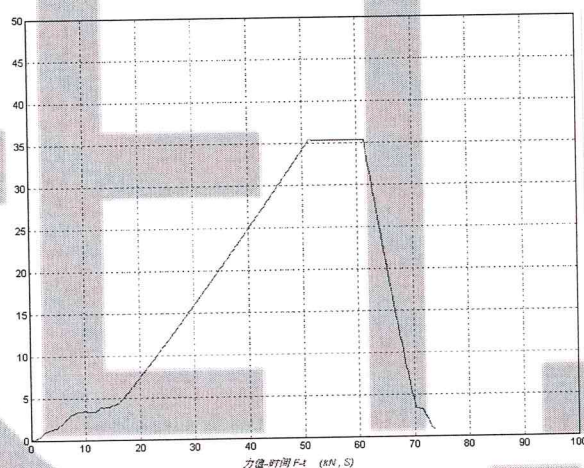
Oscillogram of mechanical routine test

FXB-24kV/70kN

POLYMERIC STRAIN TYPE INSULATOR

No.: /

19XJ0631-S-#22



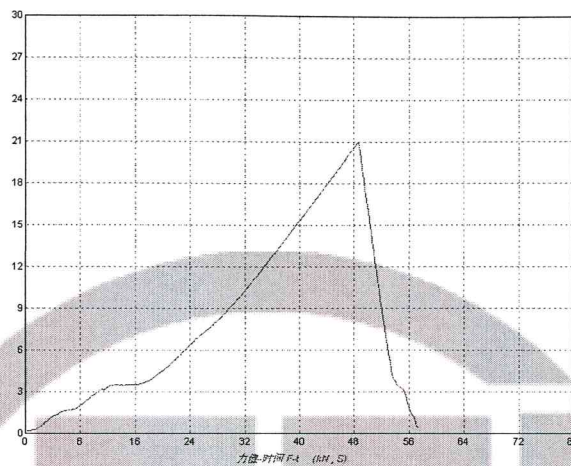
Oscillogram of tests on
interfaces and connections of
end fittings (Sudden load
release pre-stressing)

FXB-24kV/70kN

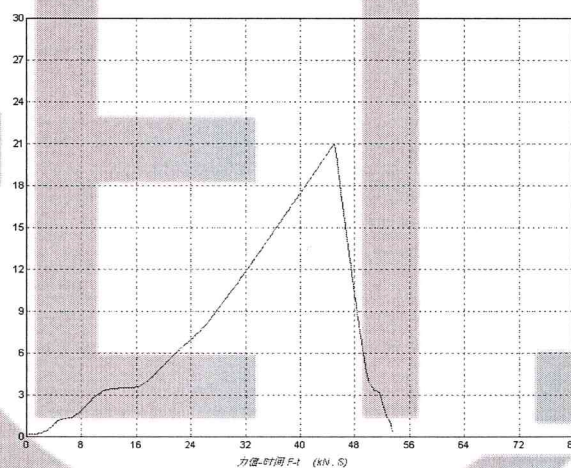
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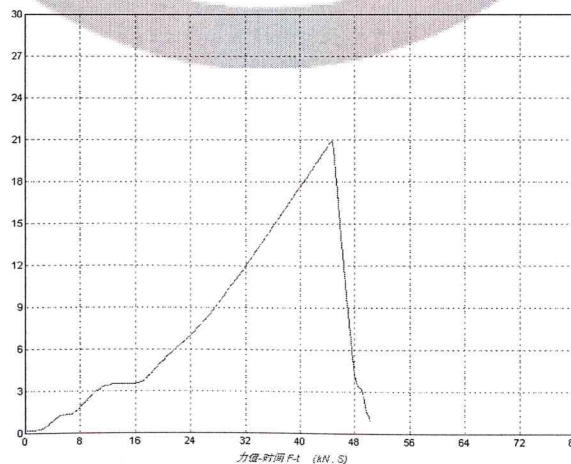
19XJ0631-S-#01~#03 (01)



19XJ0631-S-#01~#03 (02)



19XJ0631-S-#01~#03 (03)



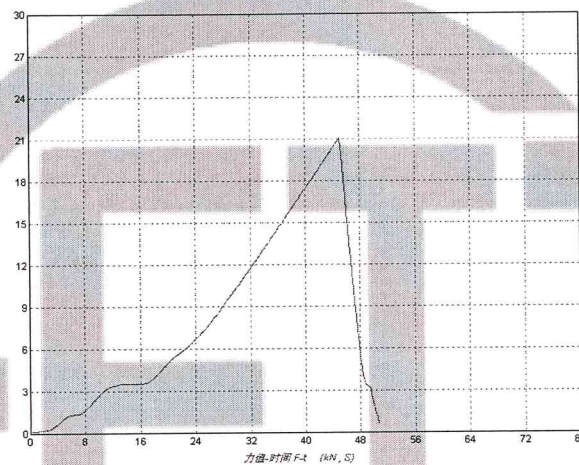
Oscillogram of tests on
interfaces and connections of
end fittings (Sudden load
release pre-stressing)

FXB-24kV/70kN

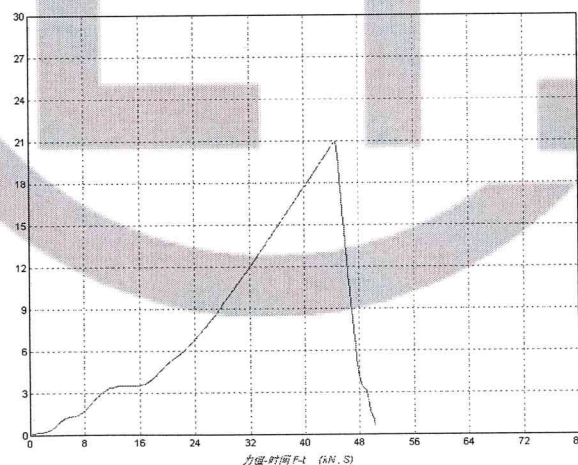
POLYMERIC STRAIN TYPE INSULATOR

No.: /

19XJ0631-S-#01~#03 (04)



19XJ0631-S-#01~#03 (05)

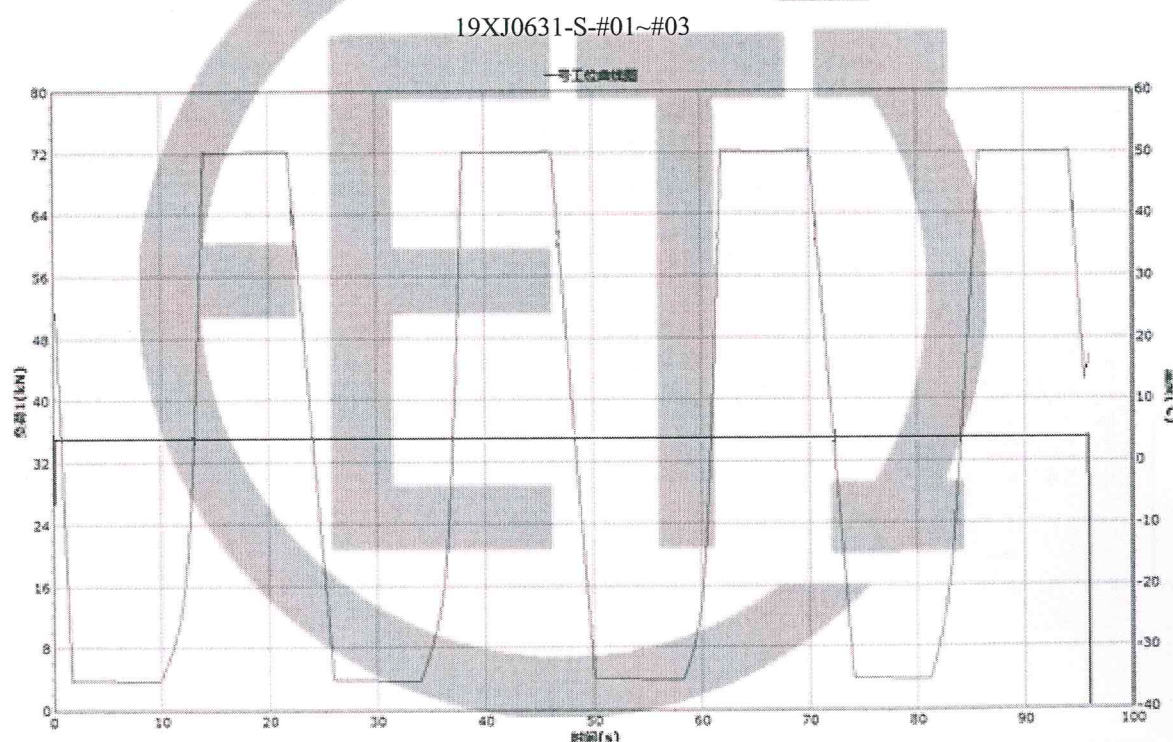


Oscillogram of tests on
interfaces and connections of
end fittings
(Thermal-mechanical
pre-stressing)

FXB-24kV/70kN

POLYMERIC STRAIN TYPE INSULATOR

No.: /



Oscillogram of tests on interfaces and connections of end fittings (Steep-front impulse voltage test)

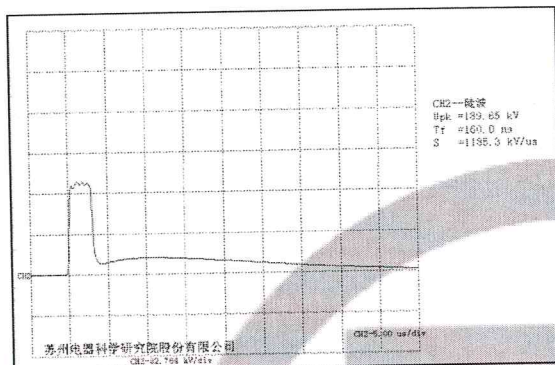
FXB-24kV/70kN

POLYMERIC STRAIN TYPE INSULATOR

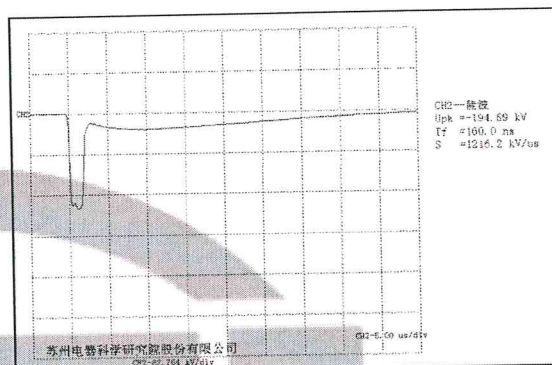
No.: /

19XJ0631-S-#01

Positive polarity

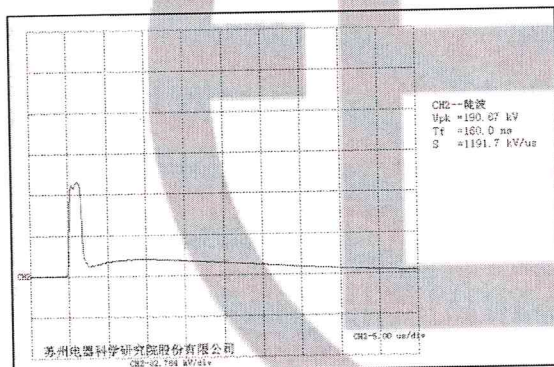


Negative polarity

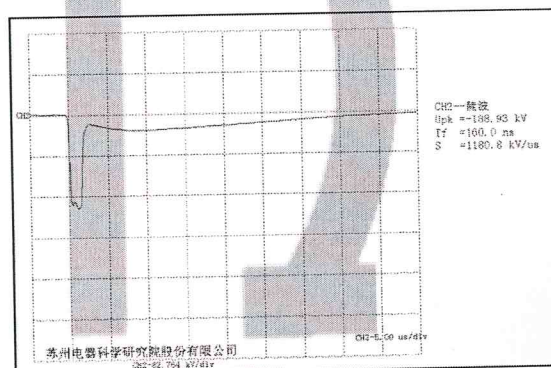


19XJ0631-S-#02

Positive polarity

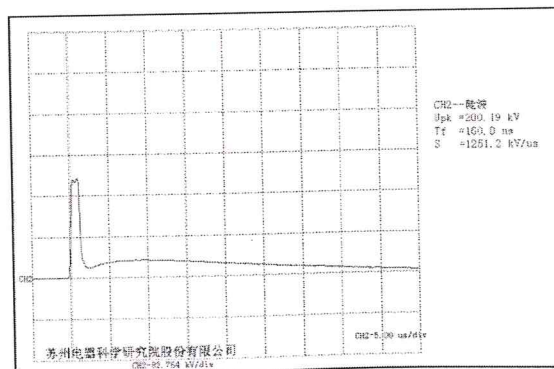


Negative polarity

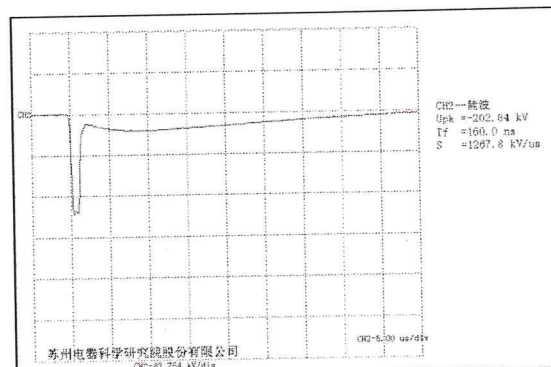


19XJ0631-S-#03

Positive polarity



Negative polarity



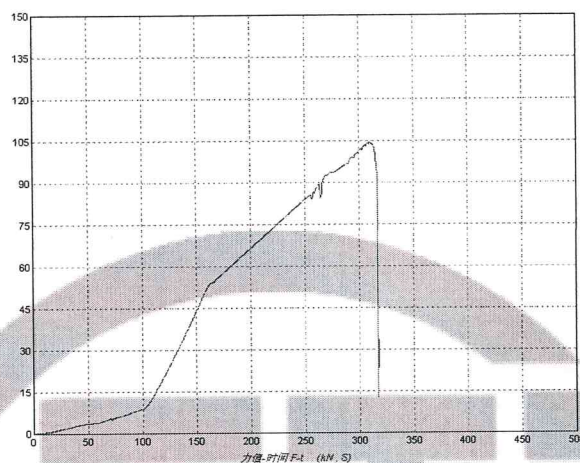
Oscillogram of assembled core load-time test

FXB-24kV/70kN

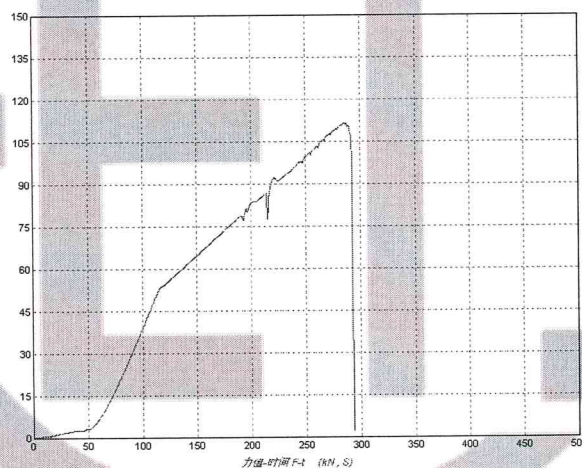
POLYMERIC STRAIN TYPE INSULATOR

No.: /

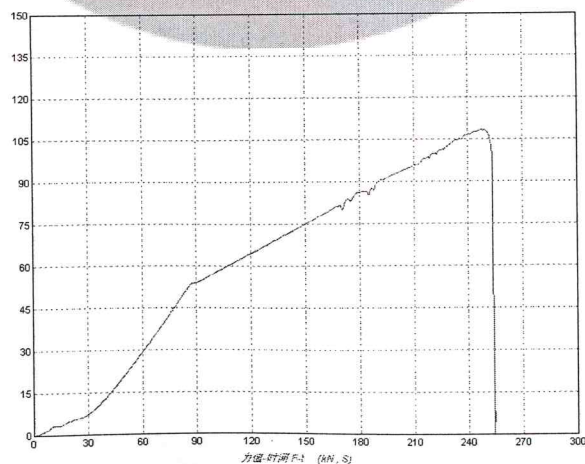
19XJ0631-S-#06



19XJ0631-S-#07



19XJ0631-S-#08

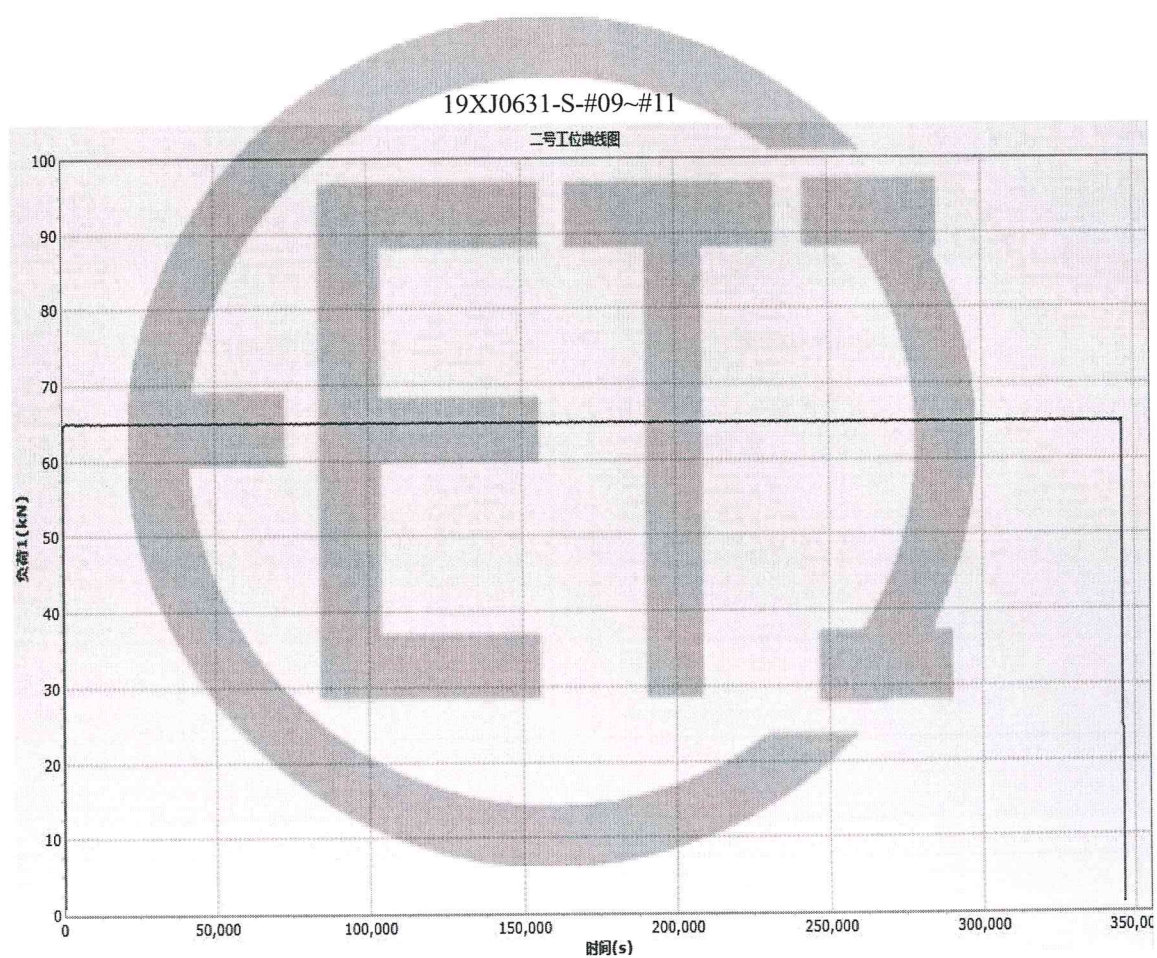


Oscillogram of assembled core load-time test

FXB-24kV/70kN

POLYMERIC STRAIN TYPE INSULATOR

No.: /



Oscillogram of dry lightning impulse withstand voltage test

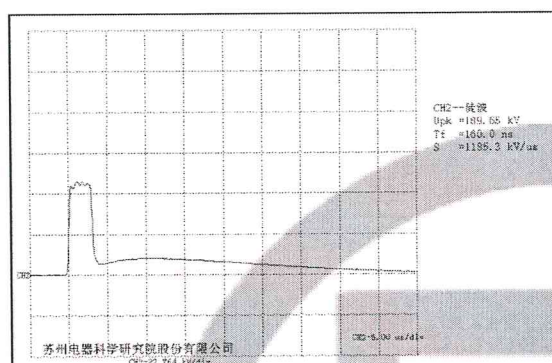
FXB-24kV/70kN

POLYMERIC STRAIN TYPE INSULATOR

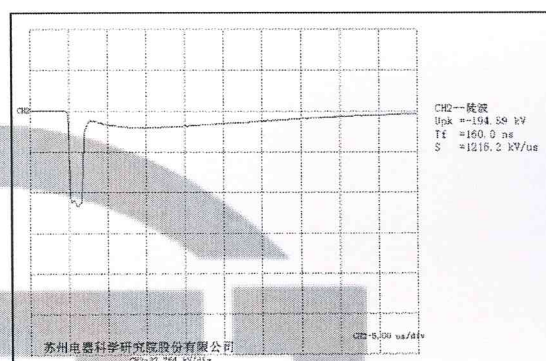
No.: /

19XJ0631-S-#16

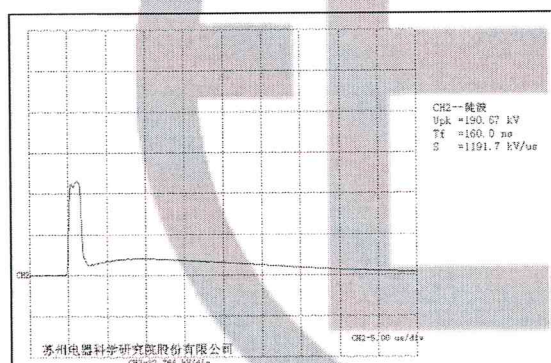
Positive polarity



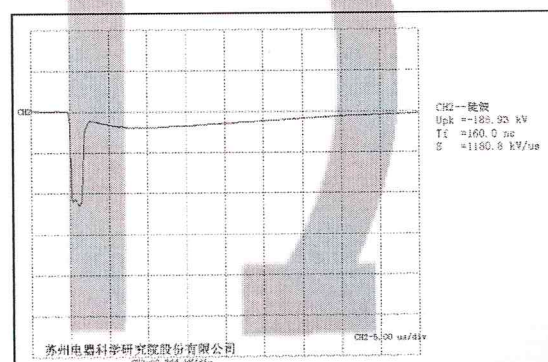
Negative polarity



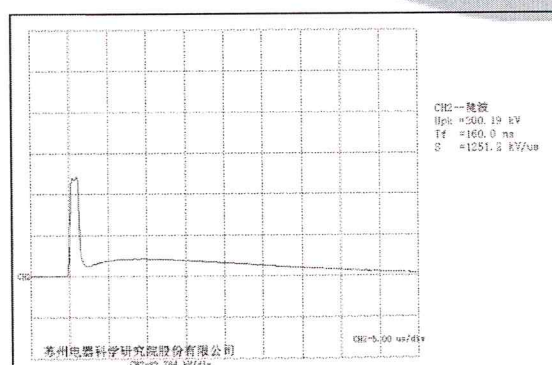
Positive polarity



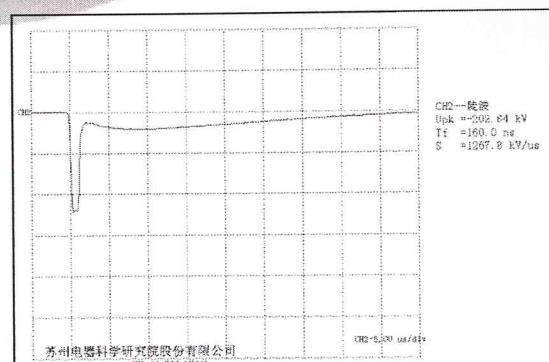
Negative polarity



Positive polarity



Negative polarity

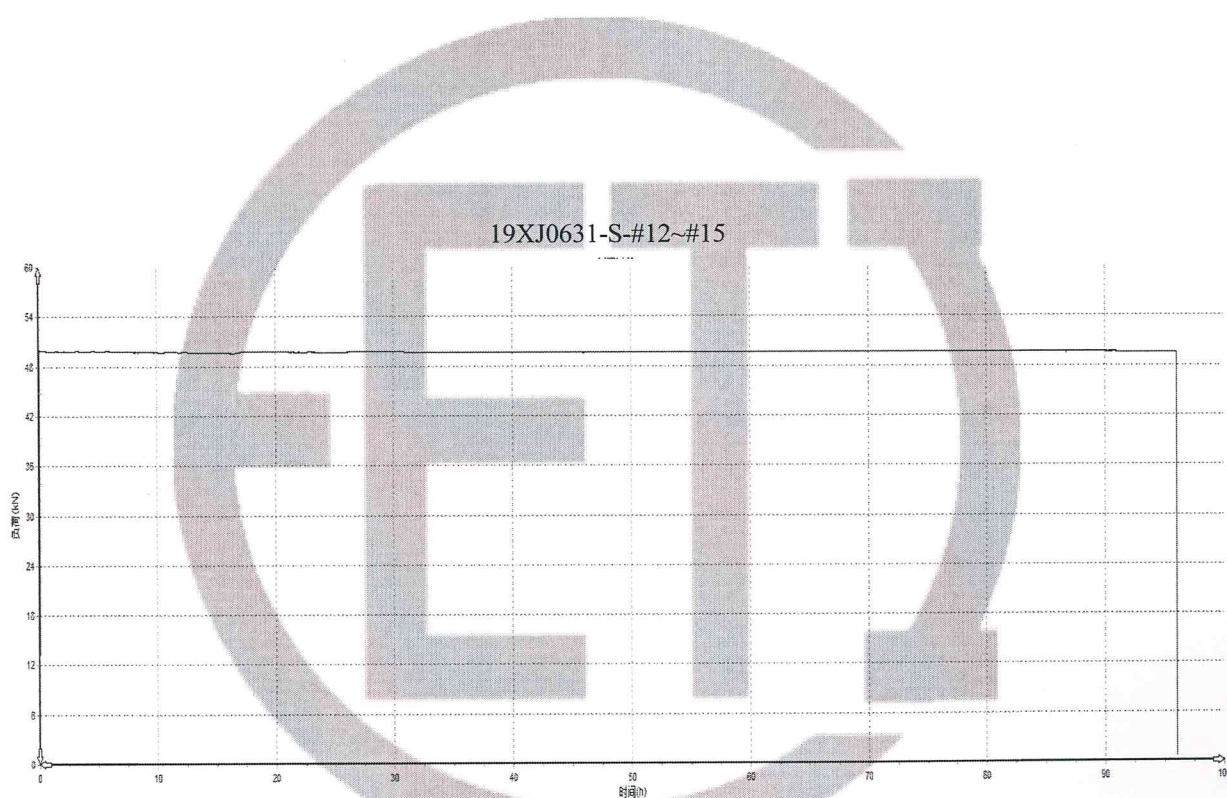


Oscillogram of damage limit
proof test and test of the
tightness of the interface
between end fittings and
insulator housing

FXB-24kV/70kN

POLYMERIC STRAIN TYPE INSULATOR

No.: /



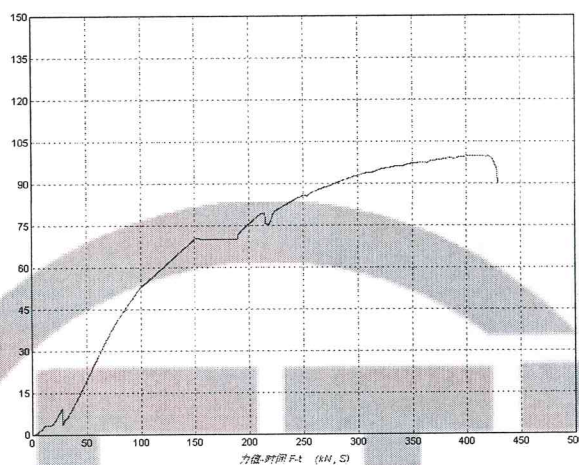
Oscillogram of damage limit
proof test and test of the
tightness of the interface
between end fittings and
insulator housing

FXB-24kV/70kN

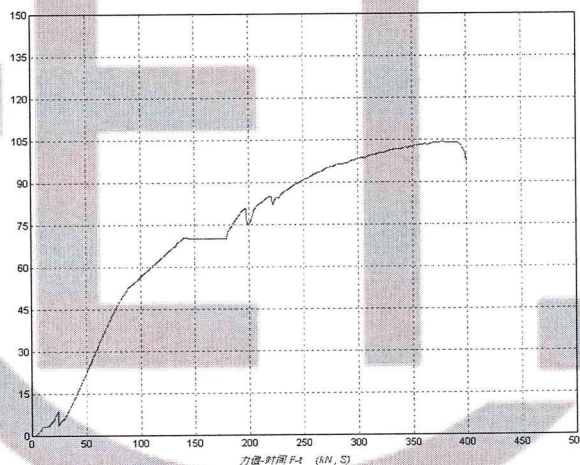
POLYMERIC STRAIN TYPE INSULATOR

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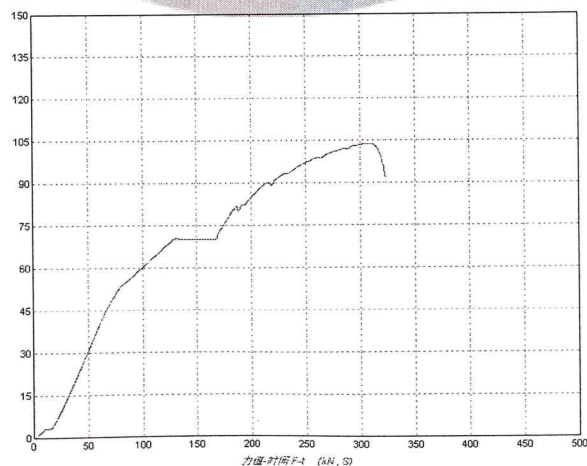
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19XJ0631-S-#14



19XJ0631-S-#15

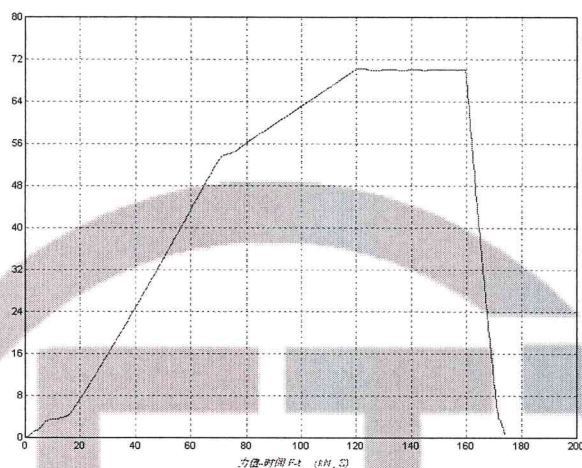


Oscillogram of verification of
the tightness of the interface
between end fittings and
insulator housing and
verification of the specified
mechanical load

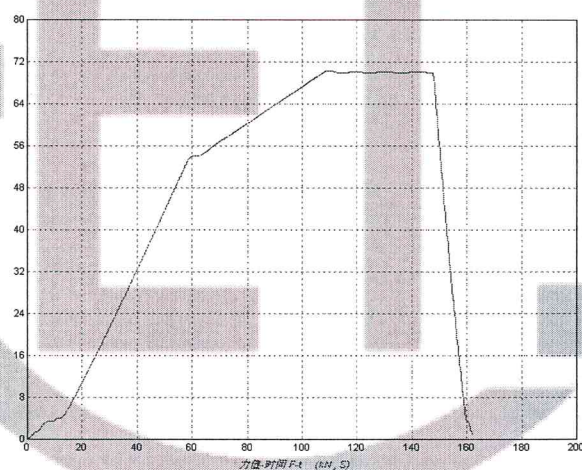
FXB-24kV/70kN
POLYMERIC STRAIN TYPE INSULATOR

No.: /

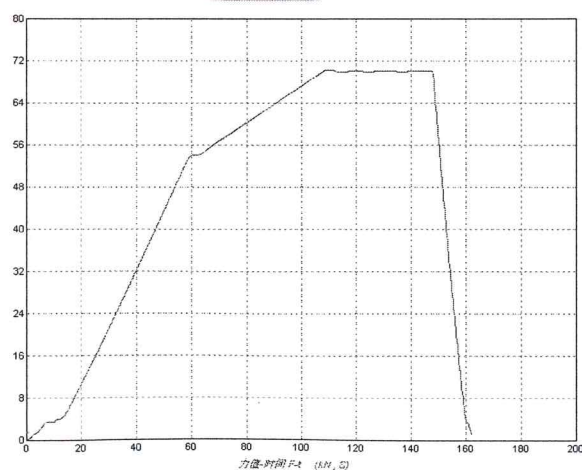
19XJ0631-S-#16



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19XJ0631-S-#18



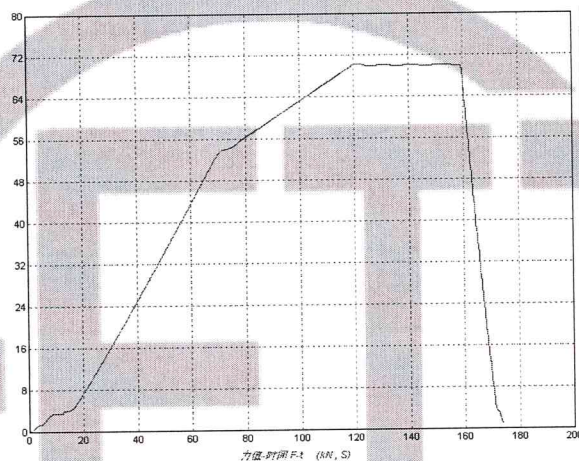
Oscillogram of verification of
the tightness of the interface
between end fittings and
insulator housing and
verification of the specified
mechanical load

FXB-24kV/70kN

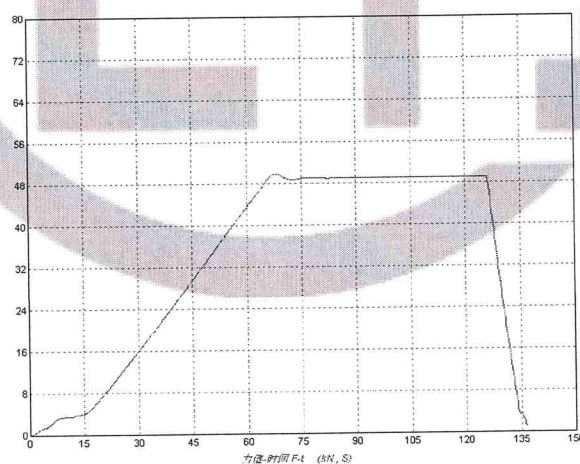
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19XJ0631-S-#19



19XJ0631-S-#20



No text below

DECLARATION

1. The report is invalid without special seal for testing and page combining seal on the report;
2. The report is invalid if altered;
3. The report is invalid without signatures of persons for drawing up, proof-reading, reviewing and approval;
4. The report is valid only for the inspected and tested samples.

NOTICE

1. In case there is any objection to this report, please raise it to the laboratory within fifteen days starting from the date of receiving the report. Thank you for your cooperation.
2. In case there is no objection, please take back the samples within one month starting from the date of receiving the report, when the manufacturer is going to take back the samples, certificate for sample taking and along with the written approval for the report should be brought in presence, only then the samples could be taken back. On time due, the samples will be in the laboratory's own disposal.

The Test Report is in total 48 pages including 20 figures and 1 photo

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