



NANJING ELECTRIC



Quality Management
System Certification



TOUGHENED GLASS

INSULATORS OF CAP AND PIN TYPE

ANSI, CSA – US and Canada

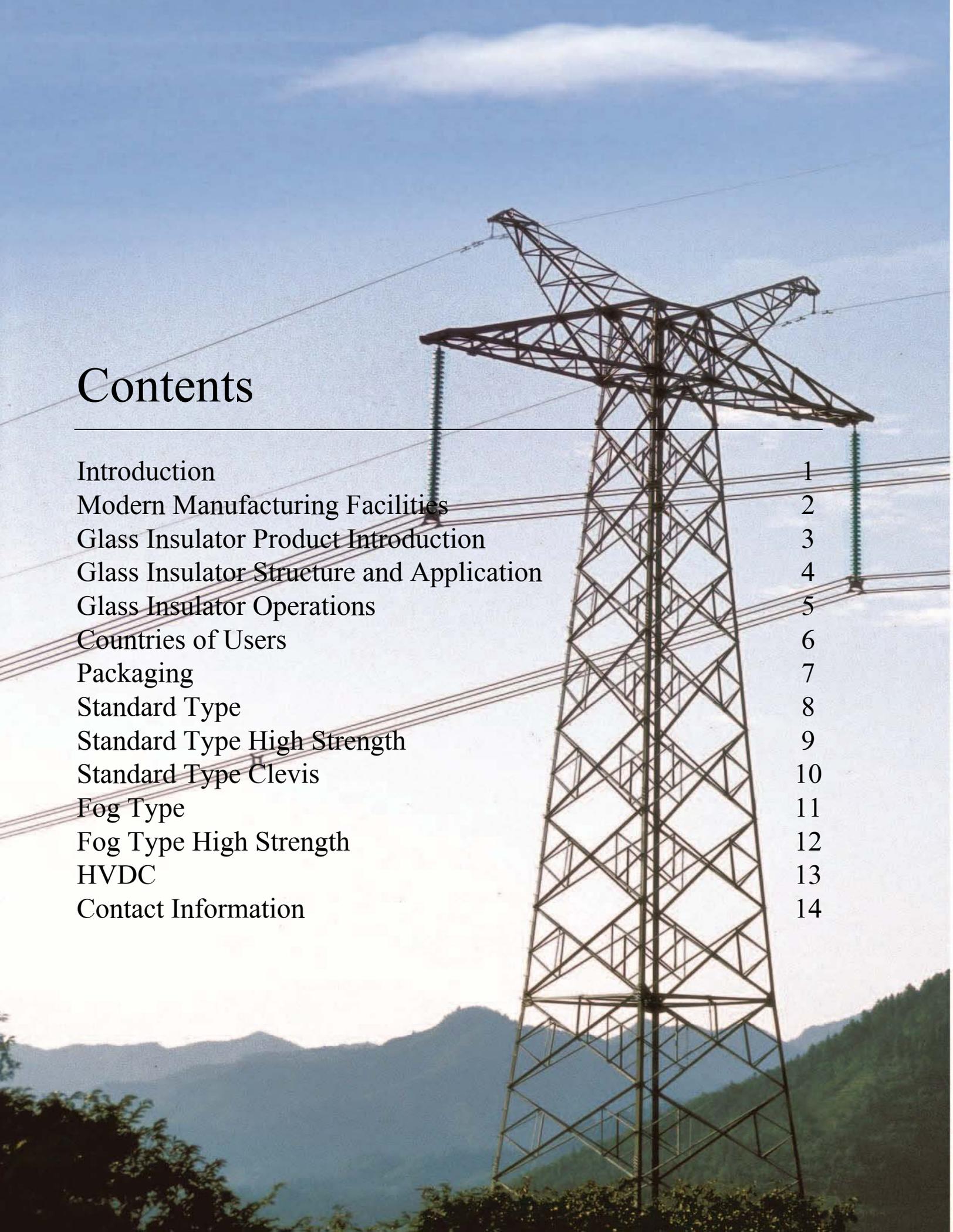
Standard AC and HVDC



NANJING ELECTRIC (GROUP) CO, LTD

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Introduction

Nanjing Electric Group Co., LTD was founded in 1936 under its former name of Nanjing Electro-Ceramic Factory. It is one of the largest scale, first class, enterprises in China for producing insulators and electro-apparatus products. Located in Nanjing City, Nanjing Electric is a high-technology manufacturer with quality management certified in conformity with ISO9001: 2000. The manufacturing scale, technology, advanced equipment, product offering, quality management, as well as company profits, are in an advanced position in this field in China. The trademark “Thunder-Lightning” on the products registered in 1937 is famous in this country.

The company covers an area of 390,000 square meters with a production area of 170,000 square meters. The campus consists of six professional systems and one joint venture. Nanjing Electric is the largest producer of toughened glass insulators in China. With about 2800 employees, over 600 are engineers. Five are senior experts who receive special allowance from the State Council Government, and seven have become Jiangsu Province “333 Project” training potentials.

The company now manufactures 10 product categories consisting of thousands of varieties including 40~550kN HVAC and 160~550kN HVDC toughened glass insulators. Other products include 20~1000kV capacitor bushings, 110~220kV HV transformers, 15~220kV HV disconnections and HV porcelain insulators, large scale bushing insulators, and spark plugs. In addition to supplying the domestic electric power construction, railway electrification and subway industries, Nanjing Electric supplies quality products to more than 50 countries across the world. Toughened glass insulators, with technology gain from foreign expertise and relying on our own intellectual property rights of production, has achieved the current international products premium standard. As a result of Nanjing Electric's technological innovation of new products, these toughened glass insulators have been used in over 300 foreign and domestic ultrahigh voltage transmission lines (500kV and 765kV). At present, the production capacity of toughened glass insulators is over 12 million units per year with 5 automatic production lines.



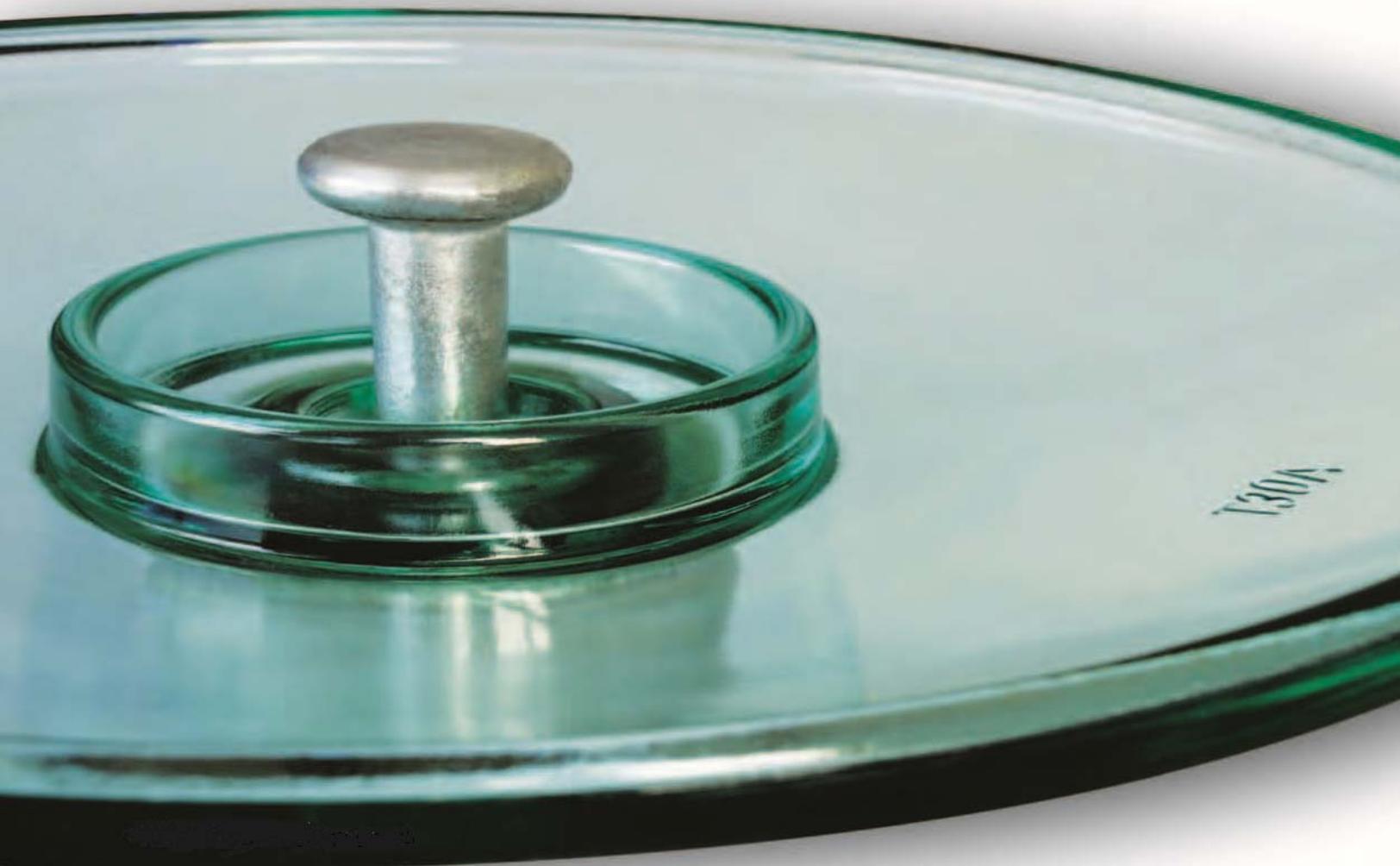
Modern Manufacturing Facilities

To meet the domestic and overseas market requirements, Nanjing Electric has developed advanced manufacturing technology and equipment. In 2005, the company modified the existing production technology and added 3 new manufacturing lines in 2006. Nanjing Electric has become a world class producer of glass insulators, with 5 automated production lines and can produce 12 million glass insulators annually.



Glass Insulator Product Introduction

In 1958 Nanjing Electric produced its first glass insulator which has become the main product line for the company today. Since this time, over 200 million Nanjing Electric insulators are still in operation in various transmission lines from 35kV to 750kV across the world. In China, there are over 10 million units in operation on 500kV and 750kV transmission lines, and 3000 units supplied to 1000kV ultrahigh voltage base. Today, Nanjing Electric provides multiple glass insulator types including standard profile, fog profile, DC profile, spherical, and open profile ranging from 70kN to 550kN M&E strength. All Nanjing Electric toughened glass insulators comply to the standards of ANSI, IEC, AS and BS.





Glass Insulator Structure and Application

Glass insulators consist of a cast iron cap, a toughened glass body, and a pin which is agglutinated together by cement into a single integrated unit. A cylindrical pin head has been adopted for superior structure, less dimension, lighter weight, higher strength and longer creepage distance which can save metallic materials and reduce transmission line cost.



OHSMS Certification
GB/T28001-2001



Environmental Management Systems Certification
GB/T24001-2004 idt ISO 14001-2004



Quality Management System Certification
GB/T19001-2008 idt ISO9001-2008

Glass Insulator Operation

Zero spontaneous breakage and easy inspection

One feature of glass insulators is zero-spontaneous leakage. A cursory visual inspection from the ground or helicopter can be made rather than climbing towers for inspections. The yearly spontaneous breakage rate of products produced from new manufacturing line is 0.02%. The result is less labor intensity for inspection and reduced maintenance cost.

Excellent arc-resistance and vibration-proof performance

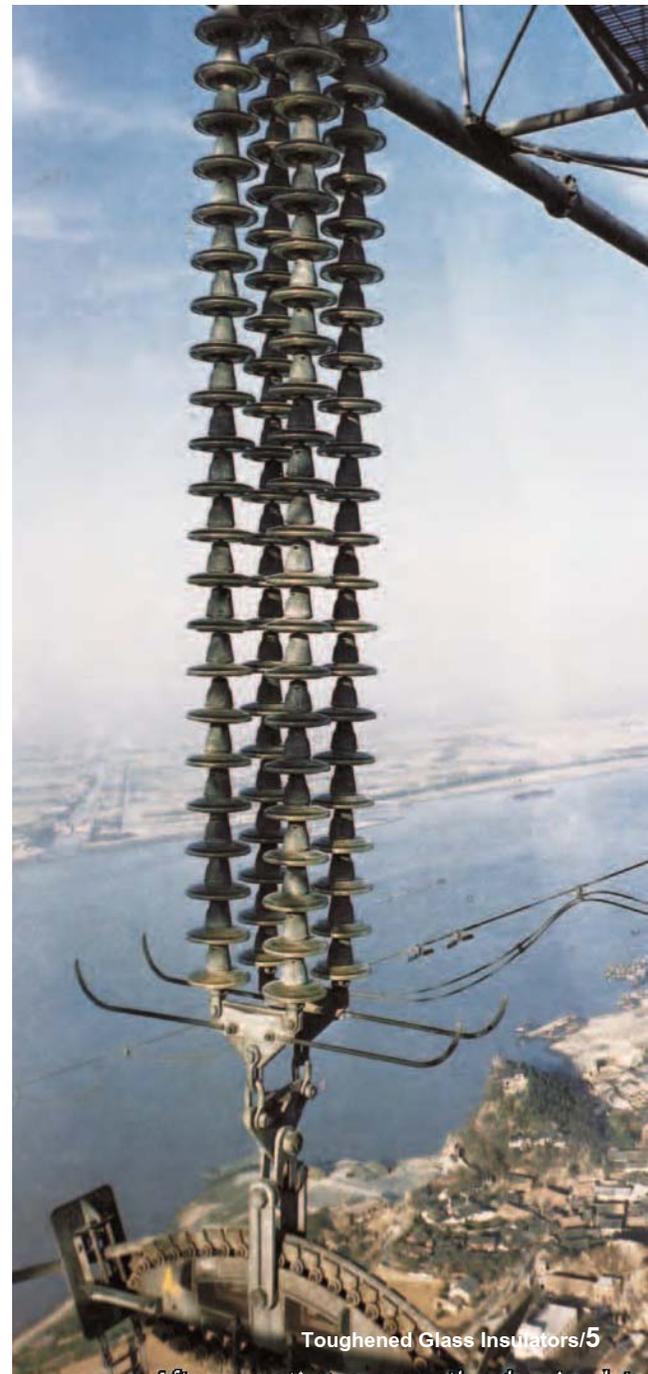
In lightning conditions, the surface of the glass insulator remains smooth with the aid of a protective layer of internal strength produced by toughening. Also, in icy conditions, there is a common occurrence of waving for glass insulators. Samples taken from various icy transmission lines have proven that the M&E strength has been sufficient even in the severest weather conditions.

Good self cleaning and less age

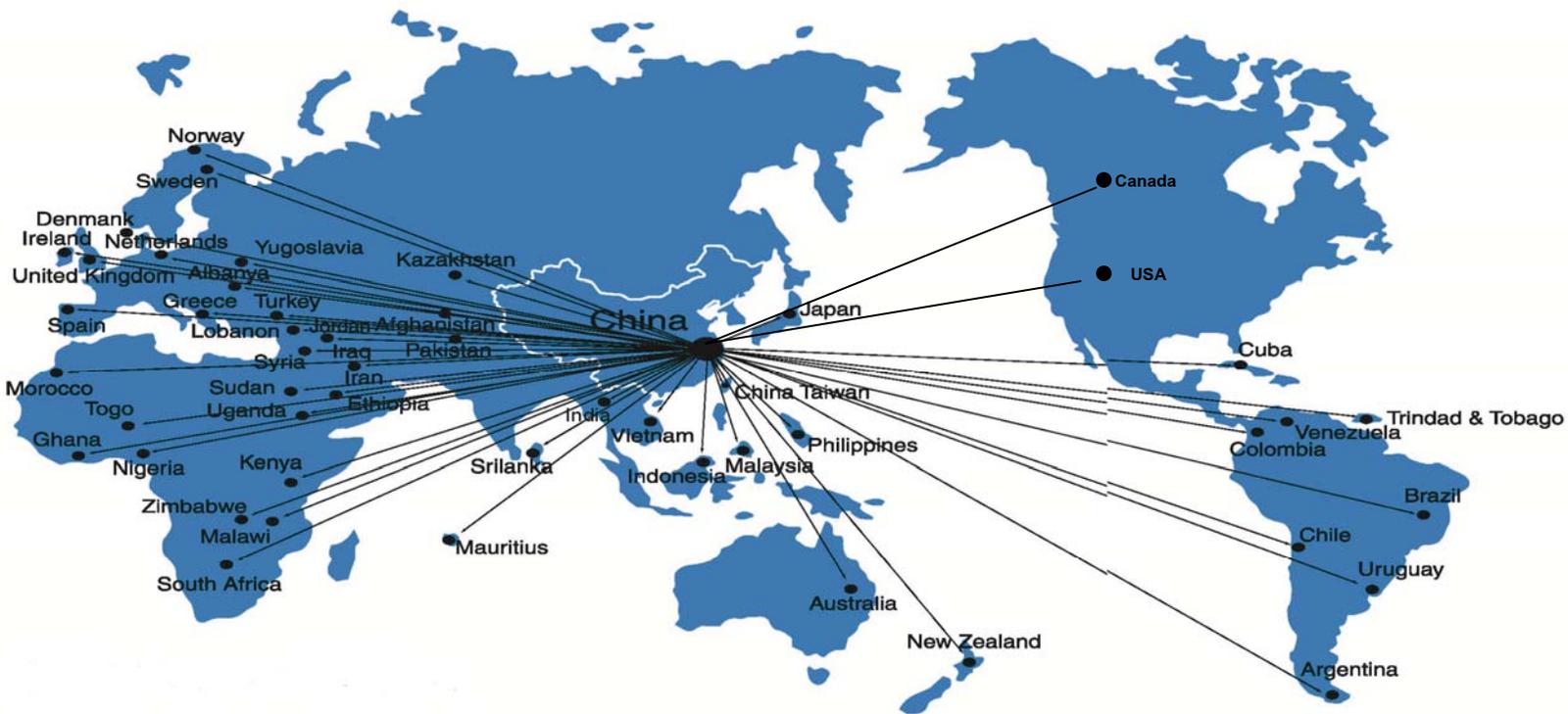
It is often reported by Electric Power Departments that glass insulators accumulate less dirt. The self cleaning properties of glass allows for less aging of the insulator. Glass insulator samples have been taken from power lines in operation for over 25 years, yet showed very little aging even in pollution areas.

Large main electric capacitance, homogenous distribution of voltage on single string insulators

Due to dielectric constant of glass, it gives the insulator a larger main electric capacitance and homogenous distribution of voltage on a single string insulator. It effectively decreases voltage acted upon glass insulator near conducting line and ground which can weaken radio interference and reduce corona extinction loss.



Worldwide Users



Nanjing insulators are operating in over 60 countries across the world



Packaging



Using the most advanced packaging methods ensures protection of our products during shipment to arrive damage free and in a manner which will allow ease of handling, storage and distribution

Shown here, Fog type glass insulators are packed in wooden crates and are reinforced and secured with wire bindings. The crate is internally braced to permit stacking.

Internally supported wooden crates are evenly stacked on wooden pallets for shipping. Pallets are secured with steel banding and protected with polyethylene film.

Pallets are clearly labeled to include contents, vendor, vendor part number, vendor job number, customer purchase order number and handling instructions. Additional, labeling available per customer specifications.





TOUGHENED GLASS INSULATORS OF CAP AND PIN TYPE

Standard Type

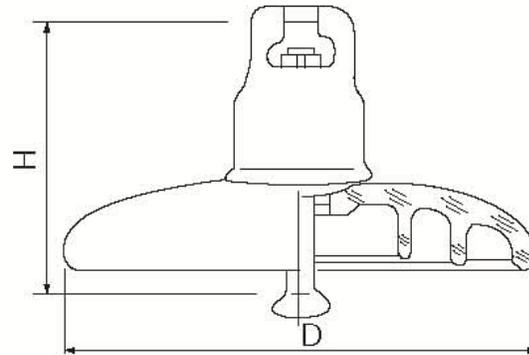


Fig. 1

ANSI

Catalog No.		LXY-70M	LXY-100M	LXY-120M	LXY-140M	LXY-160M
M&E Strength	kN	70	100	120	140	160
	lbs	15000	22000	25000	30000	36000
ANSI Class		52-3	52-3	52-5	52-5	52-8
Ball & Socket Size		B type	B type	J type	J type	K type
Fig. No.		1	1	1	1	1
Diameter D	mm	255	255	255	255	280
	inch	10	10	10	10	11
Spacing H	mm	146	146	146	146	146
	inch	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4
Creepage Distance	mm	320	320	320	320	400
	inch	12 5/8	12 5/8	12 5/8	12 5/8	15 2/3
Mechanical Values	m.N	45	45	45	45	45
Impact Strength	inch-lbs	400	400	400	400	400
Tension Proof	kN	35	50	60	68	80
	lbs	7500	11000	12500	15000	18000
Time Load	kN	44.5	67	67	80	100
	lbs	10000	15000	15000	18000	22000
Electrical Values						
Power Frequency Dry Flashover	kV	80	80	80	80	85
Power Frequency Wet Flashover	kV	50	50	50	50	55
Critical Impulse Flashover +	kV	125	125	125	125	130
Critical Impulse Flashover -	kV	130	130	130	130	135
Power Frequency Puncture Voltage	kV	130	130	130	130	130
Power Frequency Test Voltage	kV	10	10	10	10	10
at Max RIV at 1 MHz	Uv	50	50	50	50	50
Approx Net Weight	kg	4	4	4	4	6



TOUGHENED GLASS INSULATORS OF CAP AND PIN TYPE

Standard Type – High Strength

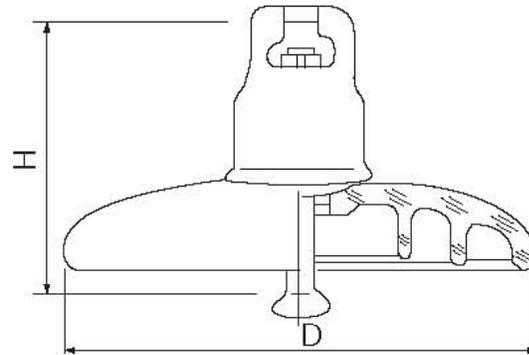


Fig. 2

ANSI, IEC, CSA

Catalog No.		LXY-180M	LXY-210M	LXY-240M	LXY-300M	LXY-420M	LXY-550M
M&E Strength	kN	180	210	240	300	420	550
	lbs	40000	50000	50000	70000	100000	125000
Class	IEC	U180B	U210B	U240B	U300B	U400B	U530B
	ANSI	52-8	52-11	52-11			
	CSA	CS-8	CS-11	CS-11	CS-13	CS-14	CS-15
Coupling	IEC	20	20	24	24	28	32
	ANSI	Type K	Type K	Type K			
	CSA	CS-8	CS-11	CS-11	CS-13	CS-14	CS-15
Fig. No.		2	2	2	2	2	2
Diameter D	mm	280	280	280	320	360	360
	inch	11.00	11.00	11.00	12.50	14.00	14.00
Spacing H	mm	146	155	155	195	205	240
	inch	5.75	6.13	6.13	7.67	8.00	9.50
Creepage Distance	mm	380	380	380	485	550	620
	inch	15.00	15.00	15.00	19.00	21.50	24.50
Tension Proof	kN	90	105	120	150	210	225
	lbs	20000	25000	25000	35000	50000	62000
Electrical Values							
Power Freq. Dry Flashover	kV	80	80	80	80	90	90
Power Freq. Wet Flashover	kV	50	50	50	50	55	55
Critical Impulse Flashover +	kV	125	140	140	130	140	140
Critical Impulse Flashover -	kV	130	140	140	130	140	140
Power Frequency Puncture Voltage	kV	130	130	125	130	140	140
Power Frequency Test Voltage	kV	10	10	10	10	10	10
At Max RIV at 1 MHz	Uv	50	50	50	50	50	50
Approximate Net Weight	kg	6.40	8.10	8.10	10.70	16.00	21.50
	lbs	14.10	17.92	17.92	23.50	35.20	47.30



TOUGHENED GLASS INSULATORS OF CAP AND PIN TYPE

Standard Type – Clevis

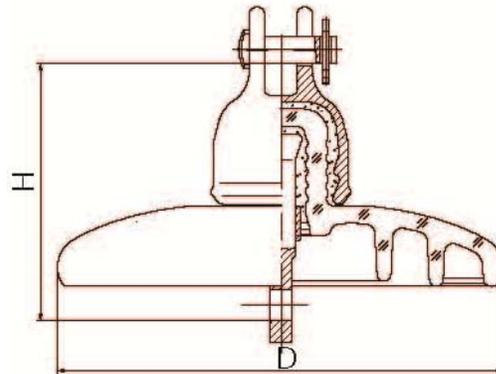


Fig. 3

ANSI

Catalog No.		LXY-70C	LXY-120C	LXY-160C
M&E Strength	kN	70	120	160
	lbs	15000	27000	36000
ANSI Class		52-4	52-6	52-10
Fig. No.		3	3	3
Diameter D	mm	255	255	280
	inch	10	10	11
Spacing H	mm	146	146	165
	inch	5 3/4	5 3/4	6 1/2
Creepage Distance	mm	320	320	380
	inch	12 5/8	12 5/8	15
Mechanical Values	m.N	45	45	45
Impact Strength	inch-lbs	400	400	400
Tension Proof	kN	35	60	80
	lbs	7500	12500	18000
Time Load	kN	45	70	110
	lbs	10000	15000	24000
Electrical Values				
Power Frequency Dry Flashover	kV	80	80	85
Power Frequency Wet Flashover	kV	50	50	55
Critical Impulse Flashover +	kV	125	125	130
Critical Impulse Flashover -	kV	130	130	135
Power Frequency Puncture Voltage	kV	130	130	130
Power Frequency Test Voltage	kV	10	10	10
at Max RIV at 1 MHz	Uv	50	50	50
Approx Net Weight	kg	4	8.8	6.1



TOUGHENED GLASS INSULATORS OF CAP AND PIN TYPE

Fog Type

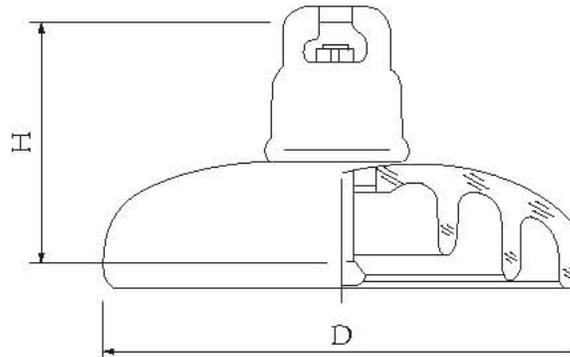


Fig. 4

ANSI

Catalog No.		LXHY-70M	LXHY-120M	LXHY-160M
M&E Strength	kN	70	120	160
	lbs	15000	25000	36000
ANSI Class		52-3FA	52-5FA	52-8FA
Fig. No.		4	4	4
Diameter D	mm	280	280	330
	inch	11	11	13
Spacing H	mm	146	146	171
	inch	5 3/4	5 3/4	6 3/4
Creepage Distance	mm	450	450	450
	inch	17 1/2	17 1/2	17 1/2
Mechanical Values	m.N	10	45	45
Impact Strength	inch-lbs	400	400	400
Tension Proof	kN	33.3	60	80
	lbs	7500	12500	18000
Time Load	kN	44.5	67	107
	lbs	10000	15000	24000
Electrical Values				
Power Frequency Dry Flashover	kV	80	100	80
Power Frequency Wet Flashover	kV	50	60	50
Critical Impulse Flashover +	kV	125	140	125
Critical Impulse Flashover -	kV	130	140	130
Power Frequency Puncture Voltage	kV	130	130	130
Power Frequency Test Voltage	kV	10	10	10
at Max RIV at 1 MHz	Uv	50	50	50
Approx Net Weight	kg	5.8	5.8	8.5



TOUGHENED GLASS INSULATORS OF CAP AND PIN TYPE

Fog Type – High Strength

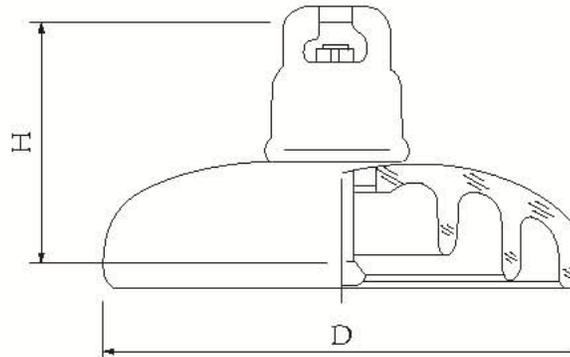


Fig. 5

ANSI

Catalog No.		LXHY-180M	LXHY-220M	LXHY-240M
M&E Strength	kN	180	222	240
	lbs	40000	50000	50000
ANSI Class		52-8	52-11	52-11
Fig. No.		5	5	5
Diameter D	mm	280	330	330
	inch	11	13	13
Spacing H	mm	171	171	171
	inch	6 3/4	6 3/4	6 3/4
Creepage Distance	mm	450	450	550
	inch	17 1/2	17 1/2	21 1/2
Mechanical Values	m.N	45	45	45
Impact Strength	inch-lbs	400	400	400
Tension Proof	kN	89	111	111
	lbs	20000	25000	25000
Time Load	kN	107	133	133
	lbs	24000	30000	30000
Electrical Values				
Power Frequency Dry Flashover	kV	80	80	80
Power Frequency Wet Flashover	kV	50	50	50
Critical Impulse Flashover +	kV	125	125	125
Critical Impulse Flashover -	kV	130	130	130
Power Frequency Puncture Voltage	kV	130	130	130
Power Frequency Test Voltage	kV	10	10	10
at Max RIV at 1 MHz	Uv	50	50	50
Approx Net Weight	kg	8.5	8.8	9



TOUGHENED GLASS INSULATORS OF CAP AND PIN TYPE HVDC

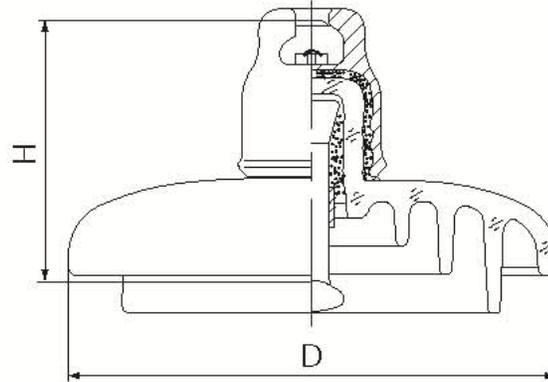


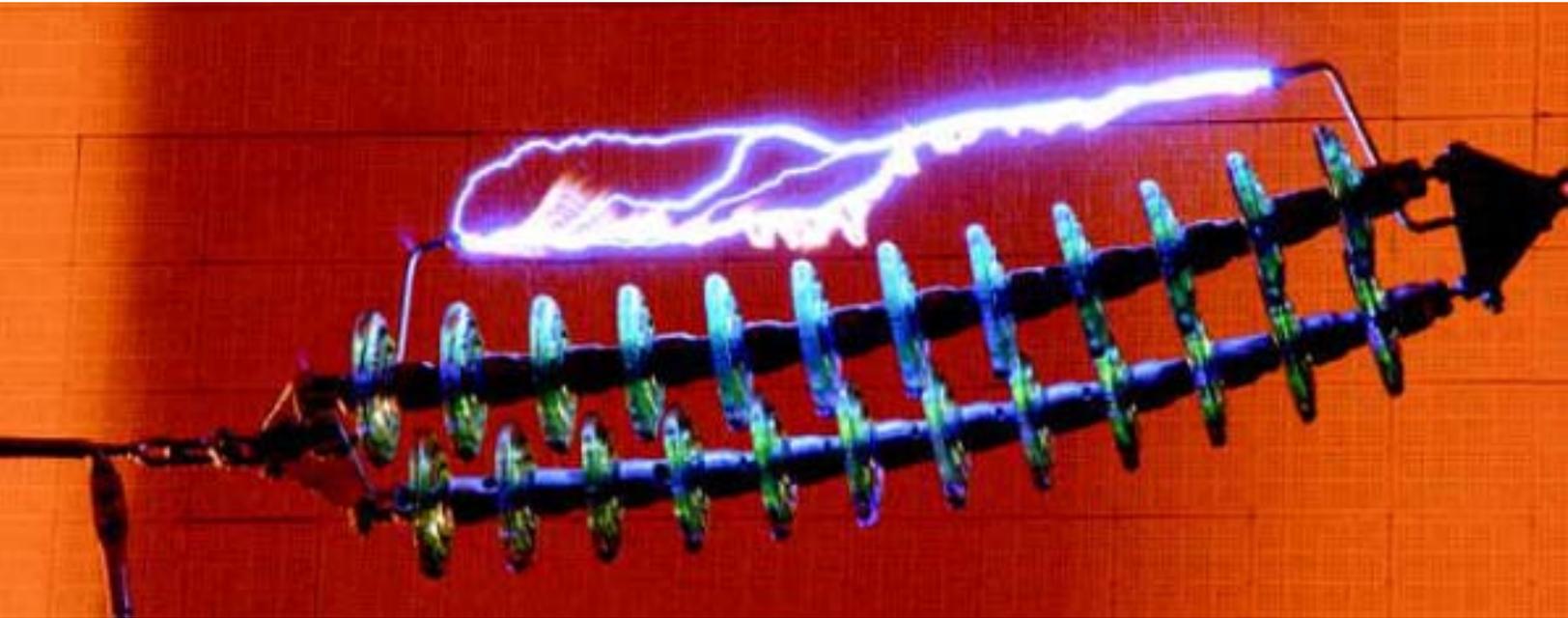
Fig. 6

ANSI, IEC, CSA

Catalog No.		LXZY-120M	LXZY-160M	LXZY-160M	LXZY-210M	LXZY-240M	LXZY-300	LXZY-420	LXZY-550
M&E Strength	kN	120	160	160	210	240	300	420	550
	lbs	25000	36000	36000	50000	50000	70000	100000	125000
Class	IEC	U120BP	U160BP	U160BP	U210BP	U240BP	U300B	U400B	U530B
	ANSI	52-5	52-8	52-8A	52-11	52-11			
	CSA	CS-5	CS-8	CS-8A	CS-11	CS-11	CS-13	CS-14	CS-15
Coupling	IEC		20	20	20	24	24	28	32
	ANSI	Type J	Type K	Type K	Type K	Type K			
	CSA	CS-5	CS-8	CS-8A	CS-11	CS-11	CS-13	CS-14	CS-15
Fig. No.		6	6	6	6	6	6	6	6
Diameter D	mm	280	280	320	320	320	360	360	360
	inch	11.00	11.00	12.50	12.50	12.50	14.25	14.25	14.25
Spacing H	mm	146	146	170	170	170	195	205	240
	inch	5.75	5.75	6.75	6.75	6.75	7.75	8.00	9.50
Creepage Distance	mm	450	550	550	550	550	645	650	670
	inch	17.67	21.67	21.67	21.67	21.67	25.40	25.50	26.50
Tension Proof	kN	60	80	80	105	120	150	220	275
	lbs	12500	18000	18000	25000	25000	35000	50000	62500
Electrical Values									
Dry One Minute +/-	kV	120	150	150	150	150	170	Contact Factory Rep.	
Wet One Minute +/-	kV	55	60	60	65	65	75	Contact Factory Rep.	
Dry Lightning Withstand Voltage (Unit)	kV	125	140	140	140	140	150	Contact Factory Rep.	
Dry Lightning Withstand Voltage (String 5 pcs.)	kV		535	535	535	535	535	Contact Factory Rep.	
DC Puncture Withstand Voltage in SF6	kV	180	225	225	225	225	225	Contact Factory Rep.	
Approximate Net Weight	kg	6.00	9.00	9.00	9.20	9.80	14.10	14.60	18.10
	lbs	13.20	19.80	19.80	20.20	21.60	31.10	32.10	39.80



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