Suizhou Case New Materials Co., LTD

ISO9001:2015 Quality management system requirements job file

manufacturer's standard

Record number: JL-QYBZ

edition:B/O

controlled device:

Distribution number:

Bup polymer insulator ISO9001:2015 quality system

1 Range

This standard specifies the models, specifications, technical requirements, inspection rules, test methods and packaging and transportation of buckled polymer (non-porcelain) insulators) for overhead insulated conductors with a nominal voltage below 1000V.

Insulators for DC systems with a nominal voltage below 1500V can be performed by reference.

2. Normative references to the reference documents

The provisions in the following documents become the provisions of this standard by reference to this standard. For all dated references, the only dated version applies to this document. The latest version of the undated references applies to this standard.

Test method for volume resistivity and surface resistivity of GB / T 1410 solid insulating materials

GB / T 2900.8 electrical term insulator

GB T 5169.16 Fire hazard test of electrical and electronic products

GB / T 5782 hexagon-head bolts

GB / T 11115 polyethylene (PE) resin

GB / T 12670 polypropylene (PP) resin

GB / T22789 polyvinyl chloride (PVC) resin

GB / T 19666 flame retardant and refractory wire and cable general rules

GB / T 16422.2 Test methods for exposure of plastic laboratory light sources- -Part 2: Xenon arc lamp

Operation regulations for DL / T 741 overhead transmission lines

DL / T 1248 overhead transmission line condition maintenance guidelines

JB / T 9673 insulator product packaging

JB / T 10316 insulated support parts and insulation materials for LV switchgear and control equipment

JB / T 10585.1 Low voltage power line insulators-Part 1 Low voltage overhead power line insulators

3 Terms and definitions

The following definitions and terms established by GB / T 2900.8 and DL / T 741 apply to this standard.

3.1 buckle polymer insulator buckling polymer insulator

An organic polymer insulator consisting of insulating parts and mounting bolts made of a polymer, using a two-flap buckle structure and mounting an insulated conductor in a buckle way.

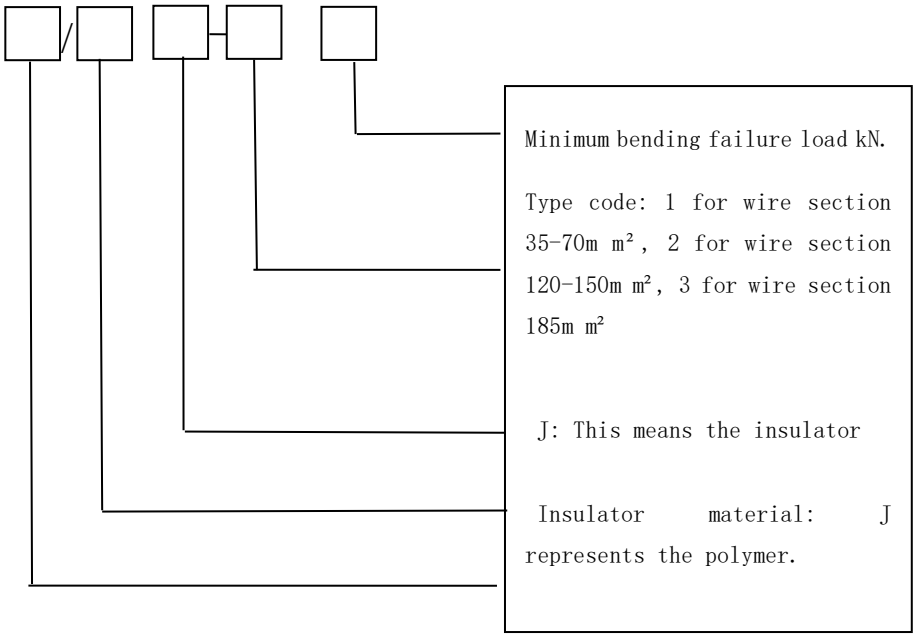
Note: Polymer materials are generally modified PVC plastics or cyclic epoxy resin and other organic polymer materials.

3.2 Horizontal lateral strength of lateral strength

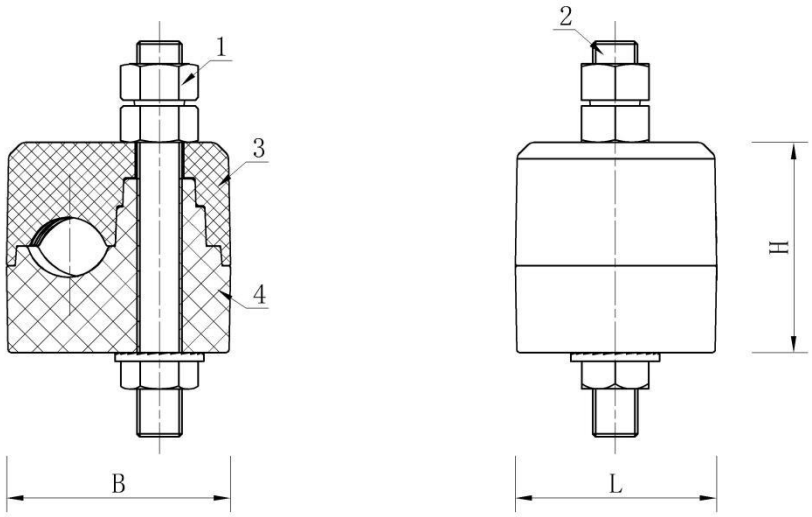
The maximum horizontal normal force of the insulator.

Model 4 specifications

Bup polymer insulator, the structure is shown in Figure 1. The insulator type code is indicated as follows:



Example: The product model is KYJJ-3 / 10 indicating the buckle polymer insulator, the nominal conductor section range of the applicable insulation line is 185m m ², and the minimum bending damage load is 10 kN.

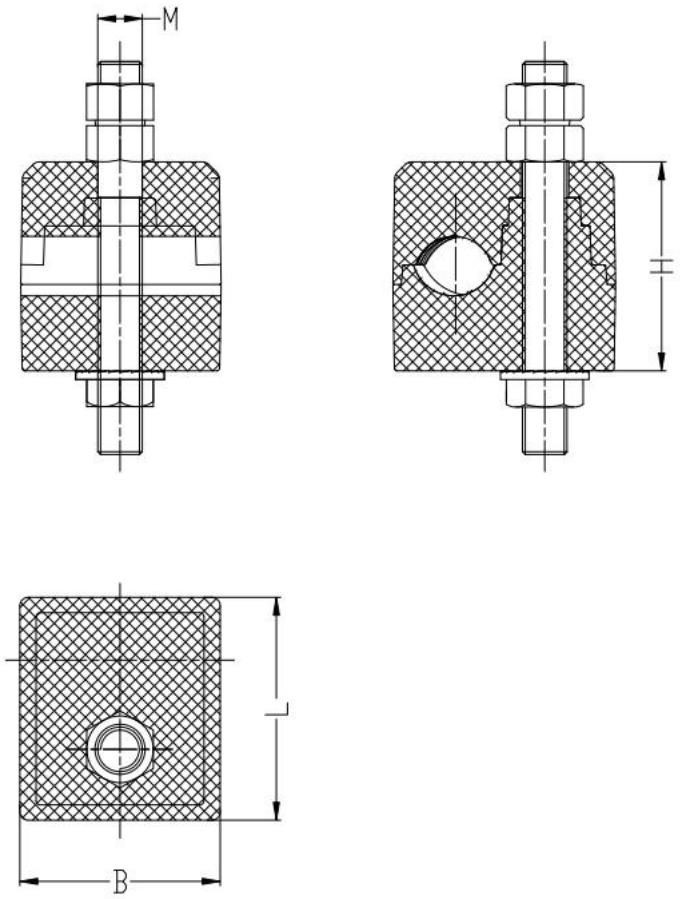


1-Torque nut; 2-bolts; 3-upper element of insulator; 4-lower element of insulator

L-total length of nominal; B-total width of nominal; H-total height; M-bolt diameter

Figure 1. Stup-type polymer insulator

Figure 2 Dimensions of buckled polymer insulators



Common buckled polymer insulators are shown in Table 1.

Table 1 Specifications of buckled polymer insulators

order number	model	Applicable wire cross-section is mm²	diameter of bolt M	The total length of the nominal L mm	The nominal total width is B mm	Public term total height H mm	Minimum bending failure load kN
1	KYJJ-1/8	35~70	16	72	67	70	8
3	KYJJ-2/10	120~150	16	72	67	70	10
5	KYJJ-3/10	185	16	72	80	76	10

Table 2 Scope of application of buckled polymer insulators

Insulator type	model	scope of application		ambient temperature
		height H	wind speed	
Bup polymer insulator	KYJJ -1/8	H≤2000	50 Meter / s	-40℃~60℃
	KYJJ -2/10			

	KYJJ -3/10			

5. Technical requirements

.15 Appearance and size

.1.1 5 Appearance

The insulation shall be uniform and dense, and the surface shall be smooth, smooth and free.

.1.2 5 Dimensions deviation

The size deviation of the insulation parts shall meet:

A) The deviation of the length, width and height shall not exceed ± 1.5mm;

B) The installation aperture shall not have a negative deviation, and the positive deviation shall not exceed 1mm;

C) Other dimensional deviations shall meet the requirements of the product drawings.

.2 5 Material characteristics of insulating parts

The material characteristics of the insulation parts shall meet the following requirements:

A) V-2 in GB / T 5169.16 (all parts);

Bb) The volume resistivity of the insulating material shall not be less than 10^{10}·Ω m (at 70℃);

C) The indentation diameter after the steel ball pressure method test shall not be greater than 2mm;

D) The UV aging resistance shall comply with GB / T 22079 test methods and requirements see 7.5.

.3 5 Electrical performance requirements

According to the standard requirements, the electrical properties of the low-voltage insulators should meet are:

a）Test voltage (effective value) shall not be less than 2500V / min;

b）The stable insulation resistance of 2500V meter for 1 meter shall be greater than 20 MΩ;

c） Pressure withstand test according to the requirements of Article 4.8 of GB / T 773-1993;

D) See DL / T 499-2001.

.4 5 Mechanical properties

The electrical and mechanical properties of the insulation parts are shown in Table 3.

Table 3 Electrical and mechanical properties of buckled polymer insulators

Insulator form	model	The mechanical damage strength is not less than	Power frequency voltage	
			Shining	Wet flash

		kN		
Bup polymer insulator	KYJJ -1/8	8	22	10
	KYJJ -2/10	10		
	KYJJ -3/10			

.5 5 Bolt and bolt galvanized layer

The t strength shall not be lower than 4.8. The bolt hot galvanizing layer shall comply with the provisions of JB / T 8177.

5.6 Tightening torque of installation tools and bolts

Use an electric torque wrench with 40-45N. The m-torque nut.

6. Inspection rules

6.1 Basic requirements

Insulators shall be inspected in batches, and the continuous production of the same batch of raw materials and the same process method shall be used as a batch.

6.2 Trial classification

Inspection of insulator typing test, sampling test and each test 3 categories.

Type tests and sampling tests as specified in this document are product finalization tests.

6.3 Type test

When the formula and process of the new raw material products are changed, the type test shall be carried out according to the test items specified in Table 3. During the test, if any of the requirements do not meet the requirements specified in Table 3, the type test shall be unqualified.

Table 4 Type-type test items

order number	Test name	Trial basis	The number of test items is only	experimental method
1	appearance inspection	5.1.1	3	7.1
2	dimension check	5.1.2	3	7.1
3	combustibility test	5.2.a)	3	7.2
4	Volume resistivity measurement	5.2.b)	3	7.3
5	heat resisting test	5.2.c)	3	7.4
6	Ultraviolet aging test	5.2.d)	3	7.5
7	Power-frequency dry flash and wet flash test	5.3	3	7.6
8	Side strength test	5.2.a)	3	7.7

9	handgrip exercise	5.2.b)	3	7.8
10	Galvanized layer test	5.5	3	7.9

6.4 Sampling test

(1) Sampling test procedures and criteria

The purpose of the sampling test is to verify the characteristics of the insulators determined by the quality of the manufacturing and the material used. Samples shall be randomly selected from the batches submitted for acceptance. The number of test samples was 2, namely E1 and E2. Sample sizes are selected in Table 4. When there are more than 10000 insulators, they should be divided into batches of 2000 to 10000 that can only be evaluated independently evaluated.

Insulator is no longer used after sampling test.

The test items of the sampling tests are shown in Table 5. If there is one unqualified in Table 5, the batch is judged to be unqualified, and the test results of each batch shall be evaluated separately.

Table 5 Sample test samples number

The unit is only

batch N	sample capacity	
	E1	E2
≤300	2	1
301～2000	4	3
2001～5000	8	4
5001～10000	12	6

Table 6 Sampling test items

order number	Test name	Trial basis	Test quantity	experimental method
1	appearance inspection	5.1.1	E1＋E2	7.1
2	dimension check	5.1.2	E1＋E2	7.1
3	Zn coating inspection	5.5	E1	7.9

6.5 Trial-by trial

The purpose of each test is to eliminate the defective insulator. Each insulator shall be tested in Table 6 during the manufacturing process. If any unqualified one is found, the insulator shall be removed.

Table 7. Test item by item

order number	Test name	Trial basis	experimental method
1	appearance inspection	5.1.1	7.1

7 Test method

7.1 Appearance and dimensional inspection

The appearance shall be inspected by visual inspection, and the size shall be measured by measuring tools required by the relevant standards.

7.2 Flamammability test

Test procedures shall be conducted in accordance with method B —— of GB / t5169.16 (all parts).

7.3 Volume resistivity measurement

Sample thickness 5mm±0.05mm, sample length 50mm ± 5mm, width 50mm ± 5mm, the number of samples 3 pieces.

The sample was dried in a 140℃ thermostatic drying box for 96h, and then the volume resistivity of the sample was measured at GB / T 31838.2 with a voltage of + 1kV.

7.4 Heat resistance test

The test method adopts the steel ball pressure method, and the test equipment is shown in Figure 2. The diameter of the steel ball is 5mm. Press it on any plane part of the insulator and apply a pressure of 20N. The test is conducted in an oven of 75℃± 2℃. After pressurization for 1h, the pressure is lifted and the diameter of the indentation is measured.

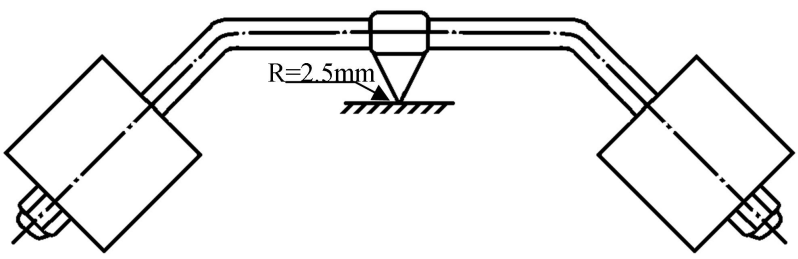


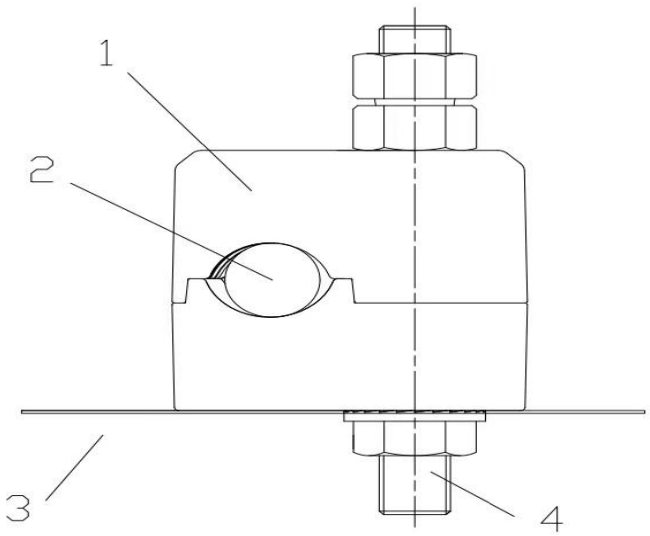
Fig. 3 Steel ball pressure method test

7.5 UV-induced aging test

1000 h UV light test according to the xenon arc lamp method in GB / T 16422.2-2014. If the sample has an insulator mark or process stamp, it should be directly exposed to UV light. The test method shall comply with the provisions of GB / T 16422.1 and GB / T 16422.2-2014. The test was conducted for 1000h according to method A of 4.1, exposure period, irradiance, and black standard temperature in GB / T 16422.2-2014 and cycle serial number 2.

7.6 Power frequency strobe test

The layout and installation of insulators during the industrial frequency strobe test are shown in Figure 3. The general conditions and test procedures of power frequency wet flashover test shall be conducted according to the provisions of GB / T 16927.1. The power frequency dry flashover voltage test only removes the artificial rain procedure. In addition, other provisions of the power frequency dry flashover voltage test and the power frequency wet flashover voltage test are the same.



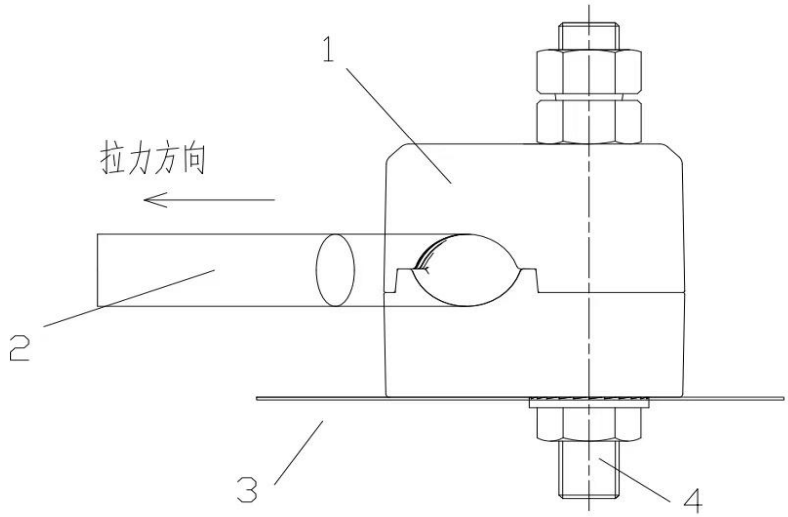
1-Test article; 2-fixed hole position; 3-support beam; 4-bolt

Figure 4. Insulator layout scheme during power frequency strobe

7.7 Side strength test

The insulation shall be installed on the tensile tester according to the approximate normal usage, as shown in Figure 4. Select 2m of insulated wire matching the insulator, install the middle end of the wire on the test insulator, then tighten

the ends of the head and tail of the insulated wire on the tension test machine, gradually increase the tension force to 5 kN to 120s; then within no less than 30s, gradually increase the tension force to KYJJ-1 / 8, tensile force of 8 kN, KYJJ-2 / 10 and KYJJ-3 / 10,10 kN, keep the insulator after the test.

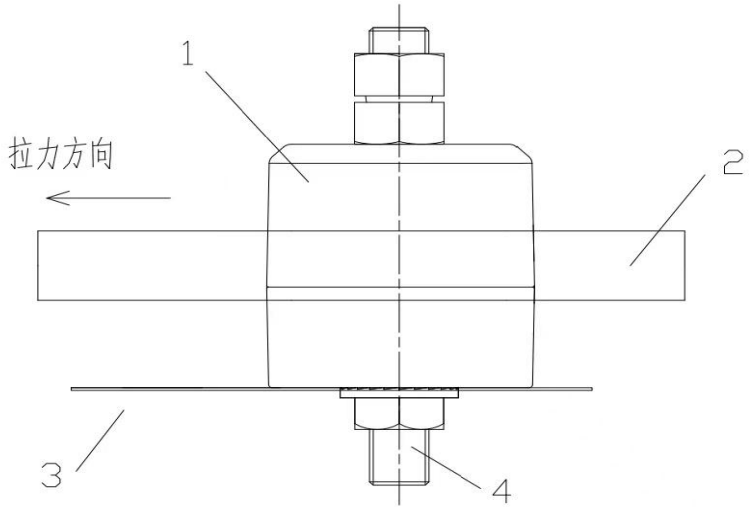


1-Test article; 2-insulated wire; 3-beam support; 4-bolt

Figure 5 Insulator layout scheme during the lateral strength test

7.8 Grip strength test

The grip strength test shall be used to match the insulator, and the tested insulator shall not be connected with the insulated wire. Install the tested insulator during the test on the tensile tester, as shown in Figure 5. With applied load to 60N, make a reference mark on the insulated wire at the outlet end of the insulator to measure the slip amount of the wire relative to the insulator; then gradually increase the tension force to 50% of the specified minimum grip force for 120s for not less than 30s; then gradually increase the tension to the specified minimum grip force value for 60s for not less than 30s. In the test, the insulation wire does not slip relative to the insulator, so the grip strength test is passed.



1-test article; 2-insulated wire; 3-beam support; 4-bolt

Figure 6 Insulator layout scheme during the grip strength test

7.9 Galvanized coating test

The test shall be carried out as specified in JB / T 8177.

8 Packaging and transportation

8.1 Packaging

The packaging material of the insulator shall ensure that its strength and performance meet the characteristics of the product and the flow environment, and shall not cause the surface color change or corrosion of the product, nor cause the insulator damage due to the deformation of the packaging material.

The insulator shall be properly secured in the packing box. The fixation method can be the buffer material plug tightening method. In general, the insulator should not be in direct contact with the packing box board, and there should be a certain gap between the inner side, inner end surface and top surface of the packing box. The packing box of the insulator shall be clean and dry and free from foreign matter.

8.2 Logo

8.2.1 Ininsulator box shall indicate:

A) Product name, manufacturer name and year of manufacture;

Bb) spec of insulator, or product code (or code);

And c) the quantity and quality of the insulators.

8.2.2 Technical documents provided with the insulator:

a) packing list;

B) Certificate of quality for factory inspection;

C) Instructions for installation and use.

8.3 Storage

Insulators shall be stored in a surrounding warehouse free of acidic, alkaline and other hazardous substances.