

GOST 9614-75
TITLE Vanished Cotton Insulation
Sleeves Specification
Tested
and
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USSR STATE STANDARD

Varnished Cotton Insulation Sleeves
Specifications
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GOST 9614 - 75
This supersedes
GOST 9614-61

Valid upto 01.01.1984

OKP Code 34 9:41

The present standard pertains to flexible varnished cotton insulating sleeves of class A heat resistance and with minimum operating temperature of minus 50°C, meant as insulating material in electrical and radio equipment, operating at upto 660 V dc or 50 Hz ac.

(Revised edition, Revision No.1)

1. Grades and Dimensions

1.1. Insulation sleeves should be manufactured as per type 1 of GOST 17675-80. Two grades of sleeves should be manufactured as indicated in Table 1.

Table 1.

Grade of sleeve	Group of sleeve as per GOST 17675-80	Code
ТЛВ (TLV)	II	34 9141 0100
ТЛМ (TLM)	II	34 9141 0200

In the grade nomenclature, the letters denote the following:-

- T - Sleeve
- Л(L) - Varnished
- В(V) - for operation in air as medium
- М - for operation in transformer oil (oil-resistant)

The OKP codes for different grades and standard dimensions of sleeves as per "All-Union index of industrial and agricultural products" are given in the reference appendix.

1.2. Sleeve dimensions should conform to the values, indicated in Table 2.

Table 2

Internal diameter		Wall thickness		Length	
Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
0.50 0.75	± 0.1	0.5	± 0.1	1000	± 50
1.0 1.5	± 0.2	0.6	± 0.15		
2.0 2.5 3.0 3.5 4.0 4.5	0.2	0.7	± 0.2		
5.0	+ 0.5 - 0.4				
6.0 7.0 8.0 9.0 10.0	+ 0.5 - 0.4	0.9	± 0.2		

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Sleeves may be supplied in lengths from 100 to 950 mm in steps of 50 mm upto 5% of the batch.

Example of conventional designation of sleeves is as given in GOST 17675 - 80.

1.1, 1.2. (Revised edition, revision No.1)

2. TECHNICAL REQUIREMENTS

2.1. Sleeves should conform to the requirements of GOST 17675 - 80 and of the present standard.

2.2. The following materials should be used in the manufacture

of sleeves: cotton cord - sleeves, manufactured from unbleached cotton twisted yarn No. 85/2 and 170/2, combed fleece of high and first sort as per GOST 6904-70 and insulating varnish on refined flax oil and polyester varnish base.

Other varieties of varnishes and cord-sleeve may be used provided the quality of insulation sleeve based on them does not fall short of the requirements, specified in this standard.

Use of these materials should be mutually agreed upon by the leading manufacturing ministry and the main consuming ministry.

2.3. The external appearance of sleeves should conform to the requirements of GOST 17675 - 80.

2.4. Insulation sleeves should be manufactured in natural colour (from yellow to dark brown) as well as by using coloured threads in cord-sleeve.

2.5. Sleeve should be elastic and should withstand the following number of reverse bends without damage (appearance of cracks or damage to varnish coat).

10 - for sleeves of diameter from 0.5 to 5.0 mm;

8 - for sleeves of diameter above 5.0 up to 10 mm.

2.6. Sleeves should be mechanically stable to abrasion and should withstand the number of double motions of abrading wire, specified in Table 3, without damage to the external surface of varnish film

Table 3

Internal diameter	Diameter of abrading wire, mm	Number of double motions
From 1.0 to 3.5	0.67	20
Over 3.5 to 5.0	1.0	40
Over 5.0 to 10.0	1.5	60

Sleeves of diameter less than 1.0 mm are not tested for resistance to abrasion.

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2.7. Sleeves should be stable to local wall puncture at a temperature of 15 to 35°C and should withstand a test voltage of 8 kV for 1 minute on the two wall thicknesses held together.

Weight of load together with insulating plate should conform to the following:

3 kg for sleeves of internal diameter from 1 to 5 mm;

5 kg for sleeves of internal diameter over 5 upto 10 mm.

Sleeves of diameter less than 1 mm are not tested for puncture.

(Revised edition, Revision No.1)

2.8. (Deleted. Revision No.1)

2.9. Sleeves should conform to the requirements specified in Table 5 in respect of physical and chemical properties. Table 5

Parameter	Requirements
1. Holding in a thermostat - at a temperature of $120 \pm 2^\circ\text{C}$ for 48 hours.	Varnish film should not crack up or peel off. <i>Darkening of varnish is allowed.</i>
2. Holding at a temperature of minus $50 \pm 2^\circ\text{C}$ for 2 hours	Varnish film should not crack up or peel off
3. Soaking in benzine at a temperature of 15 to 35°C for 24 hours.	Varnish layer should not peel off or become sticky.
4. Soaking in transformer oil at a temperature of $90 \pm 2^\circ\text{C}$ for grade TLV for 8 hours for grade TLM for 72 hours.	Sleeves should not get twisted. Varnish layer should not crackle or become sticky. The colour may become dark.
5. Organic acid content in sleeves of grade TLM.	Not more than 0.35 mg of KOH per gram of oil

2.10. Breakdown voltage of sleeves in initial condition and after exposure should conform to the values specified in Table 6.

Table 6.

Kind of exposure	Breakdown voltage 50 Hz ac, kV, not less than, for grades TIV and TIM
1. Initial condition *	5.0
2. Bending an angle $\pi/2$ rad (90°)	
3. Soaking in benzine for 24 hours at a temperature of 15 to 35°C.	4.0
4. Soaking in transformer oil at a temperature of $90 \pm 2^\circ\text{C}$ for 8 hours, for sleeves of grade TIV for 72 hours for sleeves of grade TIM..	5.0 6.0
5. Holding in a thermostat at a temperature of $120 \pm 2^\circ\text{C}$ for 48 hours.	5.0
6. Soaking at a relative humidity of $95 \pm 2\%$ and a temperature of 15 to 35°C for 24 hours.	2.0
7. Holding at a temperature of minus $50 \pm 2^\circ\text{C}$ for 2 hours.	1.0
8. Bending around a rod to an angle of π rad (180°)	1.0
9. (Deleted, Revision No.1)	
10. Abrasion of internal surface of sleeves	3.0
x. At a temperature of 15 to 35°C and relative humidity of 45 to 75%	

2.11. Insulation resistance of sleeve should not be less than 1500 Megohms.

2.12. Sleeves should not cause corrosion of metals which are in contact with them.

(Added. Revision No.1.)

3. ACCEPTANCE RULES

3.1. Acceptance rules for sleeves are as per GOST 17675 - 80.

3.2. Acceptance tests on sleeves should be carried out for conformity with the requirements of clauses 1.2, 2.3, 2.5, 2.9 Page 6
(Item 5 of Table 5): 2.10 (items 1 and 2 of Table 6) and in addition, item 4 of Table 6 for sleeves of grade TLM and clause 2.11. Sampling scale for acceptance tests is as follows:

Specimens of total length 3 m from a batch for tests against clause 1.2.

Each sleeve of a batch for tests against clauses 2.3 and 2.4;

Specimens of total length 3 m from a batch for tests against clause 2.9 (item 5 of Table 5)

10 specimens each of sleeves of all diameters of a batch for tests against clause 2.10 (items 1, 2 and 4 of Table 6)

3 specimens each of sleeves of all diameters of a batch for tests against clause 2.11.

3.3. Periodic testing of sleeves should be carried out as per clauses 2.6 to 2.8 and 2.10 (items 3 to 8 and 10 of Table 6) on a batch, which has passed acceptance tests. Periodic tests are carried out for checking conformity with the requirements of : clauses 2.6, 2.8 and 2.10 (items 3 to 8 and 10 of Table 6) - on 10 samples for each diameter and

clause 2.7 on 8 samples of each diameter in the batch

(Revised edition. Revision No.1)

3.4. The sampling scale for the customer's check of the quality of sleeves, their marking and packing for conformity with the requirements of the present standard is the same as for acceptance and periodic tests. Sleeves covered by a single quality certificate constitute a batch.

If unsatisfactory test results are obtained in respect of one or more parameters, the particular tests are repeated on twice the number of specimens.

4. METHODS OF TESTING

4.1. Selection of specimens and methods of testing are as per GOST 17675 - 80.

4.2. The following reagents (Galosha) transformer oil as per GOST 982-68, benzine, grade (BR-1) as per GOST 443-76, synthetic technical ethyl alcohol as per GOST 11547-76, potassium hydroxide, distilled water as per GOST 6709-74, yellow nitroso indicator (δ) and indicator grade PKC (are used while testing against all clauses of Table 5 and 6).

4.3. Wall thickness of sleeves as per clause 1.2 of this standard is determined along the longitudinal band according to GOST 17675-80.

None of the measured values of thickness should exceed the limits specified in Table 2.

4.4. Sleeve specimens in the initial condition are placed in a thermostat held at a temperature of $120 \pm 2^\circ\text{C}$ for testing sleeves, against item 1 of Table 5 and item 5 of Table 6 of this standard.

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Specimens are removed from the thermostat after the lapse of the specified period and tested

4.5. Sleeves are tested against item 2 of Table 5 and items 7 and 8 of Table 6 of this standard as below. Sleeve specimens are placed in a thermostat at a temperature of $\text{minus } 50 \pm 2^\circ\text{C}$ according to

item 2 of Table 5 and item 7 of Table 6. The specimens are taken out from the thermostat after the lapse of the specified period and tested.

4.5. The sleeve specimens are mounted over a conductor as per GOST 17675 - 80, bent to an angle of π rad (180°) around a rod of diameter five times the sleeve diameter.

4.6. Sleeve specimens are immersed in transformer oil heated upto a temperature of $90 \pm 2^\circ\text{C}$ and in benzine, ensuring that no aggressive substance falls inside the sleeves for testing as per items 3 and 4 of Table 5 and items 3 and 4 of Table 6 of the present standard. The specimens are taken out after the lapse of the specified period; held in air and then tested.

4.7. Sleeves are tested against item 5 of Table 5 of this standard in the following manner. Sleeve specimens are sliced into small pieces of size not more than 3×5 mm using scissors. The ^{Pieces} pieces weighing 10 g ~~are~~ are immersed in transformer oil (GOST 982-68) with ratio of sleeve weight to weight of oil 1:10 and heated in a thermostat upto a temperature of $100 \pm 2^\circ\text{C}$ for 72 hours. The acidity is then determined as per GOST 5985 - 79. The same transformer oil without sleeves is heated simultaneously under the same conditions and its acidity number is checked. The difference between the acidity numbers should not exceed 0.35 mg of KOH for 1 gram of oil. Two samples from two sleeves are taken for this test.

4.8. Sleeves are tested against clause 2.11 of ^{the} standard according to GOST 6433.2-71. A metallic rod of diameter equal to the internal diameter of the sleeve is inserted tightly into the specimen. Ring electrodes made of aluminium foil as per GOST 618-73 of thickness 0.01 mm and length 30 mm are placed

on the external surface of the specimen at equal distances from the ends. Insulation resistance of sleeves is measured with a 500 V megohmmeter.

4.9. The arithmetic mean of ten determinations against each item of Table 6 and the arithmetic mean of three determinations against clause 2.11 are taken as the test results.

The minimum value of breakdown voltage of each specimen should not be less than 60% of the values specified in Table 6.

5. MARKING, PACKING, TRANSPORT AND STORAGE

5.1. Marking, packing, transport and storage of sleeves are done as per GOST 17675 - 80. Page 8

5.2. Sleeves in packets should be stored in a racks in layers of height not more than 20 cm.

6. MANUFACTURER'S GUARANTEE

6.1. The sleeves should be accepted by the manufacturer's quality control department. The manufacturer should guarantee conformity of sleeves with the requirements of this standard provided the storage conditions defined in the standard are observed by the customer.

The guarantee shelf life of sleeves is 6 months from the date of manufacture.

The sleeves should be checked for conformity with the requirements of this standard before use after the lapse of the specified guaranteed shelf life.

x For reference

Gr S	Inside diameter mm.	OKF Code
	0,50	0101
	0,75	0102
	1,00	0103
	1,50	0104
	2,00	0105
	2,50	0106
	3,00	0107
	3,50	0108
	4,00	0109
	4,50	0110
	5,00	0111
	6,00	0112
	7,00	0113
	8,00	0114
	9,00	0115
	10,00	0116
	0,50	0201
	0,75	0202
	1,00	0203
	1,50	0204
	2,00	0205
	2,50	0206
	3,00	0207
	3,50	0208
	4,00	0209
	4,50	0210
	5,00	0211
	6,00	0212
	7,00	0213
	8,00	0214
	9,00	0215
	10,00	0216

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