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ARMURED VEHICLE PROJECT AVADI		SIDORINA	Translated by
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SCREENED CABLES WITH PVC INSULATION AND SHEATHING

SPECIFICATIONS

TY 16-505.232-77

To CI (100)

These specifications cover screened cables with PVC insulation and sheathing, hereafter called as "cables", meant for fixed wiring of communication apparatus in special equipment.

The cables are meant for working under an a.c. voltage of upto 250V 50 Hz at an ambient temperature between -50 and +60°C and relative humidity upto 98% at temperature 35°C.

The example for making entry for a 5-core cable with individual screening of each core, while placing order for it and in documents of another article:

Кабло КМШ9 5 ТУ 16-505.252-77"

#### 1. TECHNICAL REQUIREMENTS

1.1. The cables should conform to requirements of those specifications.

##### 1.2. Grades and sizes

1.2.1. The cables are manufactured in following grades:

КМШЭ - multi-core cable with PVC insulation and sheathing, with individually screened cores or with double common screen;

КМШШ - multi-core cable with PVC insulation and sheathing, with common screen.

1.2.2. The number of cores, nominal thickness of insulation and sheathing, outer diameter of cables should conform to table 1.

TABLE 1  
(Dimensions in mm)

Grade	Number of cable cores	Nominal radial insulation thickness of insulation	Nominal radial thickness of sheathing	Outer diameter of cable, not more than
КМШЭ	5	0.5	1.3	11.0
	14	0.5	1.5	17.0
КМШШ	5	0.5	1.3	8.7
	7	0.5	1.5	10.0

Tolerances on nominal thickness should be not more than: (-10% for insulation and (-20% for sheathing.

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1.2.3. The construction length of cable should be not less than 50 meter. It is permissible to supply smaller size pieces of cable not less than 3 meter in length or multiples of it, amounting to not more than 10% of the supplied batch.

#### 1.3. Construction

1.3.1. The current-carrying core of the cable should have cross-sectional area of  $0.35 \text{ mm}^2$ . Construction of the current-carrying core should conform to class IV as per GOST 22483-77.

1.3.2. The current-carrying core should be made of copper wire, tinned or coated with tin-lead solder containing not less than 61% of tin. Local untinned spots are permissible.

1.3.3. The current-carrying cores should be covered with insulation made of polyvinylchloride plastic.

1.3.4. Each insulated core of cable  $MW3$  should be covered with a corecon made of copper wire (diameter not more than 0.15 mm) which is tinned with tin or tin-lead solder containing not less than 61% of tin.

1.3.5. The insulated cores of cable  $MGW3$  and the screened <sup>substituted</sup> 5-core cable  $MW3$  should be twisted into a cable. In each lay of cable two adjacent cores should be distinguished by colour of insulation from each other and from the remaining cores of the lay.

In 14-core cable  $MW3$ , six insulated cores should be twisted and enclosed in the corecon made of copper wire of diameter not more than 0.20 mm, tinned with tin or tin-lead solder containing not less than 61% of tin, <sup>over</sup> on top of which eight insulated cores should be placed.

The direction of outer lay should be opposite to the direction of inner lay. PVC cords can be used as filling during twisting of the cable.

1.3.6. <sup>These</sup> The twisting should be wound on the outside with polyamide or polyethylene terephthalate film should be wound over the twisting.

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1.3.7. In the cable of grade KMCW<sup>over</sup> on-top-of the winding there should be a screen made of copper wire of diameter not more than 0.20 mm.

1.3.8. In the 1A-core cable of grade KMW<sup>over</sup> on-top of the winding there should be a screen made of copper wires of diameter not more than 0.20 mm, tinned with tin or tin-lead solder containing not less than 81% of tin.

1.3.9. The coefficient of density for all screens should be not less than 70%. In a screen local untinned spots on individual wires or strands, not more than 50 mm in length, are permissible.

1.3.10. On-top<sup>over</sup> of the screen there should be a sheathing made of polyvinylchloride plastic.

On the surface of sheathing<sup>the</sup> following are not permissible: nags, dents, roughness and ~~thin~~-formation, if they render the outer diameter of cable beyond the limits of permissible tolerances laid down in these specifications.

It is permissible to mend insulation and sheathing using the plastic of quality not below that specified by these specifications.

1.3.11. The materials used for manufacture of cables, should conform to the following documents and standards:

- tinned copper wire - as per documents approved in the established order;
- tin - GOST 860-75;
- tin-lead solder, not below П0С-61 - GOST 21930-75;
- polyvinylchloride plastic, grade П-40-13, П-40-14 for the insulation and grade 0-40 for the sheathing - GOST 5960-72;
- polyamide film - as per documents approved in the established order;
- polyethylene terephthalate film - GOST 24251-80.

#### 1.4. Electrical parameters

1.4.1. Electrical resistance of the current-carrying cores to d.c.,

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calculated for 1 km length of cable and for a temperature of 20°C, should be not more than 57 ohms for cables which have been allotted the state mark of quality -- not more than 54 ohm.

1.4.2. Insulation resistance of cable cores with respect to all the remaining cores and between cores and the screen, reduced for a length of 1 km, should be not less than 5 mega ohms for cables which have been allotted the state mark of quality -- not less than 10 mega ohms.

1.4.3. In the ready to use form, the cables should withstand a test voltage of 1500V 50 Hz a.c. for a duration of one minute.

#### 1.5. Mechanical parameters

1.5.1. In the cable there should be no breaks and contacts between cores and screen.

#### 1.6. Reliability

1.6.1. Service life of the cable is laid down as 10 years provided the customer observes the rules for wiring and conditions for use, transportation and storage laid down by these specifications.

The service life should be counted from the day of dispatch of the cable to the customer, including the period of storage at the customer's establishment.

The actual service life of the cable is not restricted by the service life indicated in these specifications, and is determined by the technical state of cable.

#### 1.7. Marking

1.7.1. Marking of cables should be carried out in accordance with GOST 13890-82.

1.7.2. The cables should have marking done through a coloured identification thread or <sup>by</sup> pressing around the sheath at every 300 mm, maximum.

1.7.3. Following should be indicated on a tag secured to the coil:

- Grade of cable and number of cores;

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- length in meters;
- date of manufacture (month, year);
- number of these specifications;
- state mark of quality in accordance with GOST 1.0-67 for the product certified as belonging to the highest category.

### 1.8. Packing

- 1.8.1. Packing of cables should be carried out in accordance with GOST 18690-82.
- 1.8.2. The cables should be supplied in coils. The coils should be bound at not less than 5 places and wrapped in packing material. Ends of cables should be blocked with PVC adhesive tape.

### 2. METHODS OF TESTING

2.1. All tests should be carried out in normal climatic conditions: ambient temperature  $25 \pm 10^{\circ}\text{C}$ , relative humidity of air 45-80% and atmospheric pressure 84-107 kPa (630-800 mm of mercury column).

#### 2.2. Checking of construction

2.2.1. Checking of construction dimensions (paragraph 1.2.2, 1.2.3, 1.3.1, 1.3.4 and 1.5.9) should be carried out as per GOST 12177-79.

2.2.2. Checking for conformity to requirements of paragraphs 1.3.2, 1.3.3, 1.3.6, 1.3.10, 1.7 and 1.8 is carried out by visual examination without the use of magnifying devices.

#### 2.3. Checking of electrical parameters

2.3.1. Measurement of the resistance of current-carrying cores to d.c. (paragraph 1.4.1) should be carried out as per GOST 7320-70.

2.3.2. Measurement of insulation resistance (paragraph 1.4.2) should be carried out on construction lengths as per GOST 5345-70.

2.3.3. Testing under a.c. voltage (paragraph 1.4.3) should be carried out as per GOST 2090-78.

2.4. Checking of mechanical parameters

2.4.1. Checking for the absence of breaks in cores and contacts  
*hanging out*  
(paragraph 1.5.1) should be carried out by sounding or with a signal lamp.

3. TRANSPORTATION AND STORAGE

3.1. Transportation of cables should be carried out in accordance with GOST 18890-62.

3.2. Storage of cables is done in accordance with GOST 18890-62.

4. INSTRUCTIONS ON USE

4.1. Mounting and bending of cables without pre-heating should be done at temperature not below  $(-15^{\circ}\text{C})$ .

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