

**METALLIC – SHIELDING BRAIDS
OF TYPE ПМЛ**

Technical specifications

**TY 4833 – 002 – 08558606 – 95
(supersedes TY 22-3708-76)**

Translated by RUSSTRANS
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The present technical specifications deal with the metallic-shielding braids (further in text given as braids) of type ПМЖ, meant for shielding of wires, cables and other similar parts, manufactured to meet the requirements of nation and also for export.

The braids of type ПМЖ are to be manufactured in climatic version «Y» order category «3» and in a climatic version «T», order category 2 – 4 as per GOST 15150.

Example of the conventional designation of braids, meant for shielding of wires with external diameters from 6 to 10 mm of the version «Y», order category 3, is as follows:

Braid ПМЖ 6x10 Y3 TY 4833 – 002 – 08558606 – 95

Also same for version T, category 2 is as follows:

Braid ПМЖ 6x10 T2 TY 4833 –002–08558606–95

1. TECHNICAL REQUIREMENTS

1.1. Braids should correspond to the requirements of the present technical specifications and the set of the technical documents as per ПМ –00.00.

1.2. Basic parameters and dimensions.

1.2.1. The basic parameters and dimensions of the braids should be in accordance with the requirements specified in Table 1.

Table 1

Dimensions of braid	Minimum diameter of the item being shielded, mm	Maximum diameter of the item being shielded, mm	Diameter of the wire, mm	Density of the braid, %	Weight of 1 km of the braid in supply condition, in kgs, not more than
2 x 4	2	4	0.12±0.008	75	7.2
4 x 5	4	5	0.12±0.008	75	8.8
3 x 6	3	6	0.15±0.008	80	17.0
6 x 10	6	10	0.15±0.008	80	34.0
10 x 16	10	16	0.2 ^{+0.007} _{-0.004}	80	58.0
16 x 24	16	24	0.3 ^{0.011} _{-0.006}	80	125.0
24 x 30	24	30	- » -	80	145.0
30 x 40	30	40	- » -	80	190.0
40 x 55	40	55	- » -	80	260.0

1.2.2. The grades of the braids are specified in Table 2.

Table 2

48 3387 1101	ПМЛ 2x4 Y	48 3387 1116	ПМЛ 16x24 Y
48 3387 1104	ПМЛ 4x5 Y	48 3387 1118	ПМЛ 16x24 T
48 3387 1106	ПМЛ 4x5 T	48 3387 1119	ПМЛ 24x30 Y
48 3387 1107	ПМЛ 3x6 Y	48 3387 1122	ПМЛ 30x40 Y
48 3387 1109	ПМЛ 3x 6 T	48 3387 1125	ПМЛ 40x55 Y
48 3387 1110	ПМЛ 6x10 Y		
48 3387 1112	ПМЛ 6x10 T		
48 3387 1113	ПМЛ 10x16 Y		
48 3387 1115	ПМЛ 10x16 T		

1.2.3. Braids should be manufactured in sections of length not less than 2.5 m. It is permitted to manufacture braids in lengths of not less than 0.5 m in quantities not more than 8% of the general meterage.

1.2.4. The permissible tolerance limits of the length of the braids in a coil should not exceed 2%.

1.3. Characteristics.

1.3.1 Braids of type ПМЛ are to be manufactured with copper wires of grade M as per TY 16 K71.087 – 90, protected from corrosion by a coating of hot solder of type 4 of grade ПОС 40 as per GOST 21930 as per GOST 9.306 for climatic

version «Y» and hot coating «O» as per GOST 9.306 for climatic version «T».

1.3.2. Braids may be made with wires of other metals having properties close to that of copper, if requested by the customer.

1.3.3. The following are not permitted in the braids:

- absence of more than 2 wires in any section of the braid dimensions up to 6x10, including, and not more than 4-x braids of larger dimensions;

- More than 4 breaks on individual wires on a length of 1 metre and more than one breaking of one strand for wires of length of 2.5 m.

- Omission of the strand after breaking should not exceed the length equal to 5 pitches of the braiding. In the places of the breakings the ends should be briefly cut;

- Mechanical damages of the coatings.

Insignificant local defects (scratches, pricks, loss of materials and also individual improperly tinned places in not more than one wire cross-section of braids etc.) are considered as signs of rejection.

1.4. The complete specified service life of braid is 20 years (amendment 1).

1.5. Marking.

1.5.1. Each coil of wire should be accompanied with a label. The label should contain the following details:

- a) Trade mark or the name and the trade mark of the manufacturing firm;

- b) Conventional designation of the product;

- c) Quantity in metres;

- d) Date of manufacture;

- e) Stamp of the QCD.

1.5.2. The transportation marking should be in accordance with the GOST 14192.

1.6. Packing

1.6.1. The braids should be wound in to coils of 50 –1000 b/m depending upon the standard dimension. The coils should be tied at three places with twine of bast-fibres as per GOST 17308.

1.6.2. The coils of braids should be packed, without additional tying in boxes made from sheets of wooden materials as per GOST 5959, of type YI or in wooden boxes as per GOST 2991, of type II – 1.

Each box should be covered with a waterproof double-layered packing paper as per GOST 8828.

The net weight of the box should not be more than 50 kg.

1.6.3. When the products are sent by railway containers as per GOST 20435, GOST 15102 there is no need for packing. The coils are to be stacked, without additional tying in the container, lined with a double-layered waterproof packing paper as per GOST 8828.

1.6.4. Each box should contain a packing list. The packing list should contain the following details:

- a) Name or name and the trademark of the manufacturing firm;
- b) Name of the product and number of the technical specifications;
- c) Quantity of the coils and the total length;
- d) Stamp of the QCD;
- e) Date of manufacture.

2. ACCEPTANCE RULES

2.1. The manufacturing firm should carry out the acceptance tests and the periodic test.

2.2. The acceptance tests are to be sub-divided into 100% and random tests.

During the 100% tests, the coils are to be inspected for their conformity to the requirements as specified in the sub-points 1.2.3; 1.3.3.

During the random tests, the braid is inspected for ensuring its conformity to the requirements as per the sub-points 1.2.1 (dimensions); 1.5; 1.6.

Random tests are to be carried out on 5 % of the offered batch, but on not less than 3 coils.

A quantity of products which have the same standard dimensions and which are simultaneously offered for acceptance and accompanied by a single document is considered as a batch.

2.3. The periodic inspection is to be carried out every month as per the sub-points 1.2.1; 1.2.3; 1.3.3; 1.6.1 and not less than once in three years as per sub-point 1.4. The periodic inspection is to be carried out on not less than 3 samples.

2.4. In case unsatisfactory results are obtained, then repeat tests should be carried out on double the number of samples, selected from the same batch, which was returned due to unsatisfactory results.

The results of the repeat tests are considered to be final results.

3. METHODS OF INSPECTION

3.1. The testing of the braids for ensuring their conformity to the requirements

specified in sub-point 1.2.1 is to be carried out in the following manner:

- diameter of the strand is to be measured with a micrometer MP-25 as per GOST 4381;
- the passage of the diameter of the items under shielding is to be determined by fixing the sample of length (200 –300)mm on polished rods of the corresponding dimensions. During this, after fixing, the sample should be moved along the rod without any external forces.
- weight of the braids is to be determined by weighing the samples (1÷5) m on a laboratory balances as per GOST 84104 with an error of measurement upto 0.5 gms and followed by its conversion to 1 kilometre;
- the density of the braids is to be determined as per the procedure specified in the recommended Appendix 3.

3.2. Checking of the braids for ensuring their conformity to the requirements specified in sub-point 1.3.3 is to be carried out visually as per the standard specimens. The distance between the breaking of the wires and strands is to be measured with a scale as per GOST 7502 with an error of measurement up to 0.01 m.

3.3. Checking of the length of the braids in the coils as per sub-point 1.2.3 while braiding and supplying is to be carried out by a scale as per GOST 7502 with an error of measurement 0.01m or by weighing coils with an error of measurement of 5.0 gm and the subsequent determination of the length through the mass of 1 km, determined as per sub-point 3.1 of the present technical specifications.

3.4. The specified service life, specified in sub-point 1.4, is to be checked on the braids in the composition of the article during the process of operation, as per the request of the customers.

3.5. The checking as per sub-points 1.5; 1.6 is to carried out visually.

4. TRANSPORTATION AND STORAGE

4.1. Transportation of the braids is to be carried out by any means of closed transport in accordance with the rules of transportation applicable to the corresponding type of transport.

4.2. Storage of the braids should be in dry centrally heated premises on racks in horizontal position at temperature of air from +5 to 35°C and relative humidity not more than 80%. The air should be free of aggressive vapours and gases.

5. MANUFACTURER'S GUARANTEE

5.1. Manufacturer guarantees the conformity of the braids to the requirements of the present technical specifications only if the conditions for transportation and storage are observed by the customers.

The guarantee period of operation of the braids is 6 months from the day of their introduction to operation, but not more than 24 months from the moment the items have crossed the state borders.

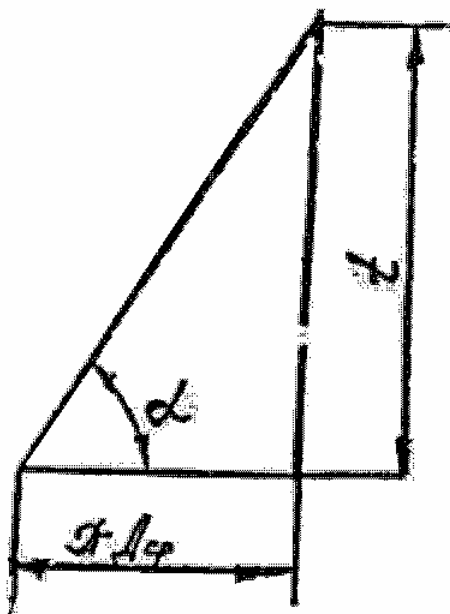
List of the reference
Standard technical documents

Conventional designation	Number of the sub point of the reference TY
GOST 9.306 Non-organic metallic and non-metallic coatings	1.3.1
GOST 2991 Dismantable wooden boxes for loads up to 500 kg.	1.6.2
GOST 4381 Control lever micrometers	3.1
GOST 3959 Dismantable boxes made of wooden sheets, for loads upto 200 kg.	1.6.2
GOST 7502 Metallic measuring scales	3.2.
GOST 8828 Double-layered packing paper	1.6.2; 1.6.3
GOST 14192 Marking of goods	1.5.2
GOST 15102 Universal metallic container of weight 5 tonnes.	1.6.3
GOST 15150 Machines, instruments and other technical products. Versions for different climatic regions. Categories, conditions of operation, storage and transportation, particularly ambient climatic factors.	Introduction
GOST 17308 Twines	1.6.1
GOST 20435 Universal metallic containers of net weight 3 tonnes.	1.6.3
GOST 21930 Tin-lead solder in ingots	1.3.1
GOST 24104 General purpose laboratory weighing balances	3.1
TY 16.K71.087–90 Round electro-technical copper wires.	1.3.1

**List of the equipments,
which are used for inspection**

Name of the instrument, stand	Type, grade	Class of accuracy
Tape GOST 7502	ОПК 2–50 АИТ/10	2
Micrometer GOST 4381	MP–0–25	1
Set of polished rods	ПМ–00.00–10	-
Common laboratory balances with weighing limit upto 5 kg with an error of measurement 0.5gm GOST 24104		4

Method for determination of the density



- t – Pitch of the braid, in mm;
- α – angle of tilting of the strand, degrees;
- d – total number of strands in the braid;
- N – number of wires in the strand;
- D – diameter of wire, in mm;
- B – total width of the strand in one direction;
- P_1 – linear density;
- D_{cp} – average diameter of braid;
- $D_{нар}$ – lateral diameter of braid in the part to be shielded, mm

Density of the braid is determined as per formula

$$P = (2P_1 - P_1^2) \cdot 100 \%,$$

$$\text{Where } P_1 = \frac{B}{t \cos \alpha}$$

$$B = \frac{a}{2} \cdot DN$$

$$t \cos \alpha = \frac{t}{N D_{cp}}$$

$$D_{cp} = D_{outer} - 2D$$

	Amendment	Designation		Reason	Code	Page	Page total
	№ 2	TY 4833-002-08558606-95		Correction of the text	9	2	2
					Implementation instruction		
Assignment	Dose not reflect on the back-log				Immediately		
Amendment	Content of change				Uses		
2							
	Given as		Should be				
	Point 1.4		Point 1.4				
	Total established service life of the braid-20years		Established service life before issuing taking into account the storage period - 20 years				
			Actual service life is not limited by the specified values, but determined by the condition of the article.				
	Point 4.5.1 to be added				Distribution		
	Guaranteed storage period of the braid- 1 year from the date of receipt						
					Appendix		