

FOR

GROUP NO. 442/5 RD

1168

FOR

SPECIFICATIONS

TY 16-535.853 - 79.

[illegible]

TABLE 1

Types of lamps.	Designation of main Design document.
TH 28 - 5	075.371.143
TH 28 - 10	073.371.143
TH 28 - 40	133.371.025
TH 28 - 40 - I	073.371.144

1.2. Basic parameters and dimensions.

1.2.1. Basic parameters of the lamps should comply with those specified in Table 2.

1.2.2. Overall and mounting dimensions, type of cap and mass of lamps should conform to these specified in Fig 1.3 of appendix 2.

TABLE 2

Types of lamps	Rated values			Limiting values	
	Voltage V	Power W	Luminous flux, cm	Power, W maximum	Luminous flux, cm, minimum.
TH28 - 5	28	5	40	5.75	34
TH28- 10		10	80	11.5	68
TH28-40 TH28-40-I		40	680	46	545

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1.3. CHARACTERISTICS

- 1.3.1. The lamps should be fit for work and retain their technical data (luminous and electric parameters) during and after the effect of the following mechanical factors:
- a. Vibratory loads at an acceleration of 7g and frequency 50HZ;
 - b. Long term vibration at an acceleration of 2.5g and frequency 50HZ;
 - c. Impact loads at an acceleration of 35g and 5-10 ms of impact duration. Total number of impacts is 600.
- 1.3.2. Lamps should be fit for work during and after the effect of the following environment factors.
- a. variation in temperature from minus 50° to plus 65° C.
 - b. 95 - 98% of relative humidity of air at 35° C.
- 1.3.3. Lamps should not have the assembly errors impairing their appearance or service properties.
- 1.3.4. Leads the lamps should be soldered (using non acid flux) or welded to the contact components of the cap in such a way that they do not obstruct the mounting of lamps in the matching guage as per GDST 17100-79.
- 1.3.5. Fastening of the cap to the bulb and also of the flange to the base shell should be firm, not to allow the separation of the base shell

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from the bulb or that of the flange from the base shell on applying the following torques to the cap or the flange.

For caps B15S/18, B15d/18, IØ-1430-I - a torque gradually increased to 1.5 N.M for 1 cap B42S/11 - a torque increased gradually to 2.0N.M

Before testing the lamps for duration of glowing and to 1.05N.M and 1.4 H.M respectively after testing the lamps for duration of glowing.

1.3.6. The lamps should, withstand 120% rated voltage for 10S.

1.3.7, Location of the filament of lamps TH 28-40 and the TH 28-40-I should be such that its projection on tab mutually, perpendicular planes A and B gets accomodated in the rectangles with dimensions specified in TABLE 3

TABLE 3

Types of lamps.	Plane A		Plane B	
	Width	Height	Width	Height
TH 28-40	7	9	3	9
TH 28-40-I				

1.3.8. Minimum duration of glow of lamps at the rated voltage and the final luminous flux should be not

less than the values specified in TABLE 4

TABLE 4

Types of lamps	rated values		Duration of glow, hr.	Final luminous flux, lm
	Voltage V	Power W		
TH 28-5		5	140	30
TH 28-10		10		61
TH 28-40	28			
TH 28-40-I		40	125	490

1.4. MARKING

1.4.1. Lamps should possess marking specifying:

- trade mark of the manufacturing plant;
- rated voltage in volts;
- rated power in watts;
- date of manufacture (quarter, year)

Marking should be distinct and hard printed on the cap by packing with marking liquid or on the bulb using the method of stamping by ^{intusing} the marking mastic.

1.4.2. Marking of the shipping container is as per

GOST-14192-77.

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1.5. PACKING.

1.5.1. The lamps should be packed in boxes made of corrugated board, type T GOST 7376-77 with grates to save the lamps from mutual contact.

Lamps TH 28-5 and TH 28-10 are packed per 100 pieces in each box.

Net weight, kg, maximum 1.0

Gross weight, Kg, maximum 1.3.

Lamps TH 28-40 and TH 28-40-I are packed per 100 or 200 pieces respectively in each box

Net weight, kg, maximum 3.0.

Gross weight, kg, maximum 3.7.

Net weight, kg, maximum 6.0

Gross weight, Kg, maximum 6.8.

1.5.2. A tag containing the following data should be attached to the box with the packed lamps:

- trade mark of the manufacturing plant;
- nomenclature of lamps;
- rated voltage in volts;
- rated power in watts;
- type of bulbs;
- No. of these specifications;
- date of packing; No. of the assembly line, stamp of QID and the customer's representative (if the lamps are accepted by the customer's representatives).

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1.5.3. Boxes with lamps are packed in group containers made of corrugated board, TYPE T as per EOST 7376-77.

Number of lamps in the box, pieces:

TH 28-5 and TH 28-10 - 1000

Net weight, kg, maximum 10.

Gross weight, kg, maximum 14.

TH 25-40 and TH 28-40-I 400 or 300

Net weight, maximum 12.

Gross weight, kg, maximum 16.

NOTE:

Upon agreement between the customer and the supplier other types of packing are allowed.

1.5.4. A tag containing the following data should be attached to the group container:

- trade mark of the manufacturing plant;
- Nomenclature of lamps;
- type of caps;
- number of lamps;
- date of packing (month and year)

2. ACCEPTANCE RULES

2.1. The lamps should be subjected to acceptance, periodic and type tests.

2.2. Each batch of lamps should be subjected to acceptance tests. In this case, the lamps presented simultaneously for acceptance, but not more than 10000pieces are taken as a batch.

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TABLE 5 CONTINUED

Nomenclature of checks and tests	Paras of specifications		Sample Size 4	Acceptance number	
	require- ments	methods		for each paragraph 5	common for all the paragraphs 6
PIECES					
fastening of cap to bulb and of flange to base shell					
5. Checking the resistance to high voltage	1.3.6	3.7			
6. Checking the location of filament	1.3.7	3.8			
7. Checking of electric para- meters	1.2.1.	3.2.	20	2	3
8. Checking of light parameters					
9. Checking of correctness of packing and mar- king of the ship ping container.	1.4.2. 1.5.1 1.5.4.	3.4.	100%	-	-

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2.3. Periodic tests should be carried out at least once in a quarter for compliance with requirements laid on sub-paragraphs 1.3.1.a; 1.3.1.c; 1.3.2.; 1.3.8 and at least once a year for compliance with requirements laid in paragraph 1.3.1.b in the sequence and according to the procedure specified in TABLE 6.

Subjected to tests should be lamps uniformly selected throughout the quarter from various days and shifts of production and which have passed the acceptance tests.

Table - 6

Nomenclature of checks and tests.		PARAMS OF SPECIFICATIONS Sample, Size, pieces				PLAN OF ACCEPTANCE			
Requirements methods		n_1	n_2	$n_1 + n_2$		A_1	B_1	d	A_2
Test for short term vibration		20	40	60	I	3	2	3	4
1.3.1a	B.9								
Impact strength test									
1.3.1B	3.10								
Test for long term vibration		20	40	60	2	4	3	4	5
1.3.1a	3.9								
Test for environmental effect									
1.3.2.	3.11				I	3	2	3	4

Plan of acceptance

Nomenclature of checks and tests.		PARAS OF SPECIFICATION		Sample, Size		Plan of acceptance				
Requirements	methods	n ₁	n ₂	n ₁ + n ₂	A ₁	B ₁	d	A ₂	B ₂	
Test for duration of glow	1.3.8.	3.12	40	60	2	4	3	4	5	
Measurement of the final luminous flux	1.3.8	3.2.								
Checking the firmness of fastening of the cap to the bulb and of the flange to the baseball after the test for duration of glow	1.3.5	3.6	10*	-	-	I	-	-	-	

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3.2.

Checking the firmness of fastening of the cap to the bulb and of the flange to the base shall after the test for duration of glow

1.3.5

3.6

n_1, n_2 - number of lamps in the first and the second samples respec
 A_1 - permissible number of defective lamps in the first sample.

A₂ - permissible number of defective lamps in two samples together.

d - number of defective lamps at which second sample is taken.

B₁ - number of defective lamps in the first sample.

B₂ - number of defective lamps in two samples together.

Results of the periodic tests are considered to be satisfactory, if the number of the defective lamps does not exceed the acceptance number and the duration of glow corresponds to ^{those} specified in para 1.3.8

If the results of the periodic tests prove to be unsatisfactory, then acceptance and dispatching of the lamps should be suspended until the parameters and the characteristics of the lamps are brought to comply with the requirements of these specifications at those prints at which unsatisfactory results were obtained.

Periodic test records should be produced to the user on his demand.

2.4. Type tests for compliance with the requirements of these specifications should be carried out when assimilating the technology of lamp production, when changing the design, technology or replacing the materials, provided these changes might affect on the quality of the lamps, and also after the revision of the specifications which include additional test requirements. Type-tests should be carried out according to the programme agreed with the customer's representative. Full scope of the type tests is

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established in TABLE 5-7

Type test records should be produced to the user on his demand.

TABLE 7

Nomenclature of checks and tests	Paras of Specifications		sample size	Acceptance Number
	require-ments	method		
1. Test for transportation	4.1.	3.13	20	2
2. Test for storage	4.2	3.14	20	2
3. Checking of mass	1.2.2.	3.3	10	0

2.5. The user reserves the right to carry out the incoming inspection of the lamps, received by him, in the scope of acceptance of these specifications.

Where the inspection is carried out in the scope of acceptance tests of these specifications, by using the plan of checking and the test procedure specified in the same.

In addition to this, the lamps of one type received by the user with one accompanying document certifying the quality of lamps should be taken as a batch.

2.6. ACCEPTANCE CARRIED OUT BY THE CUSTOMER'S

REPRESENTATIVE.

2.6.1. Lamps accepted by the quality inspection service,

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held for 3 days, and checked for lighting up are presented to the customer's representative for acceptance.

These are presented in separate batches as per the acceptance document signed by the chief engineer of the manufacturing plant and the chief quality inspector. Acceptance should be started not later than 24 hours from the moment of their presentation.

2.6.2. From each printed batch of lamps, the customer's representative in the presence of the quality inspection service builds up sample in an amount according to TABLE 5.

2.6.3. The acceptance tests are carried out in the sequence according to the programme and in the scope of

TABLE 5.

2.6.4. Results of the acceptance tests are considered to be satisfactory, if the number of the defective lamps does not exceed that given in TABLE 5.

2.6.5. The batch of lamps, which have not passed the acceptance tests, are returned to the quality inspection service for thorough rechecking for removing the defective lamps on these points on which unsatisfactory results were obtained.

2.6.6. The returned batch may be again presented to the customer's representative for acceptance, in this case a red strip and the inscription "second acceptance" should be present on the acceptance notification signed by the chief engineer of the

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plant and the chief quality inspector.

In addition to this, a statement in which specified are the causes of rejection, as well as the measures taken for their rectification is attached.

The batch presented for the second time is subject to the full scope of acceptance tests.

Checking is carried out with sample of doubled size. In this case, the number of defective lamps should not exceed that specified TABLE 5. Ⓢ

2.6.7. The accepted lamps are stamped with the stamp of the customer's representative and given to the manufacturing plant for storage for subsequent dispatch.

The stamp is put on tag of the box.

2.6.8. The periodic tests are carried out by the customer's representative jointly with the quality inspection service of the manufacturing plant in compliance with para 2.3 of these specifications.

2.6.9. For conducting periodical and type tests customers representative should select a sample of lamps which have passed the approval tests in which the lamps at different batches manufactured for tested period or from experimented batch are included.

2.6.10 When evaluating the test results lamps should not be taken into account if they go out of order accidentally. For example, if a lamp is connected to non-corresponding voltage, mechanical damage etc)

ⓧ The lamp batch which has not passed the acceptance tests, is returned to the manufacturing plant with the right of presenting it to the Customer's representative again

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3. TEST PROCEDURE

- 3.1. Unless other-wise, specified, all tests should be carried out under normal climatic conditions according to GOST 16962-71. Maximum temperature should not exceed plus 50°C and lower value of relative to Humidity is not limited.
- 3.2. Measure electrical and light parameters (paras 1.2.1, 1.3.8) according to procedure of GOST 17616-80. List of equipments recommended for checking and testing is mentioned in appendix-3.
- 3.3. Check overall and mounting dimensions (para 1.2.2) with gauges or measuring tool ensuring the accuracy of measurement required by the drawing.

Check the mass of lamps (para 1.2.2 during type tests weighing by weights with an error not exceeding 0.5 grams).

- 3.4. Check the external appearance (P 1.3.3), correctness of application and legibility of marking para 1.4.1), correctness of packing and marking of transport container (paras 1.4.2, 1.5.1 - 1.5.4) by visual inspection.

Check the marking strength of lamps (para 1.4.1.) lightly rubbing it with cloth for three times wetted in water. After rubbing, marking should be legible.

- 3.5. Fixing of terminals (P. 1.3.4) should be checked by visual inspection and by setting the lamps in appropriate guage as per GOST 17100-79.

- 3.6. Check the attachment of base to the bulb and also

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flange to the base shell (P.1.3.5) by means of device. which ensures smooth increase of the torque to the value specified in para 1.3.5.

- 3.7. check the resistance of lamps to increased voltage (p.1.3.6) using the voltage and for time specified in P.1.3.6.
- 3.8. Position of luminous element of lamps (P 1.3.6) should be checked by means of projector giving enlarged. Projection of luminous elements for two vertical mutually perpendicular planes A and B . With rectangles in corresponding scale having dimensions mentioned in Table 3. During this, filament should be set vertically to the base down-wards in lamp holder corresponding to the given type of base. One of the planes (A) should be parallel to the surface passing through the axis of base and lamp terminals.

Vertical axes of rectangles should coincide with the projections of base axes and centres of rectangles should be positioned in correspondance with the height of light centre specified in the drawing.

Power should be in limits of 5 to 10.

- 3.9. Lamps should be tested for vibration strength (P.1.3.1a) at a frequency of 50Hz with an acceleration of $7g$ for 7 hours (6 hours in nominal voltage and 1 hour in switched off condition)

Vibration test (P 1.3.16) is carried out at a frequency of 50Hz with an acceleration of $2.5g$ for 56 hours. (50 hours with nominal voltage and 6 hours

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in switched off condition)

- 3.10. Test for the impact strength (P 1.3.1a) should be carried out at an acceleration of 35g, duration of impact impulse 5 to 10ms, frequency of impacts 40 to 80 per minute at rated voltage. Total number of impacts is 600.

During tests on vibration and impact strength, position of lamps should be horizontal and plane of terminals should be parallel to the horizontal plane.

After each test lamps are switched on at rated voltage for checking on lighting up.

- 3.11. When testing in correspondance to requirements of P 1.3.2., lamps are placed in series in non-operating condition for 1 hour in heat chamber at temperature plus $65 \pm 3^{\circ}\text{C}$, for 1 hour in cold chamber at temperature minus $50 \pm 3^{\circ}\text{C}$ and for ~~48~~ ^{humidity chamber with relative} hours in humidity of 95 ^{to} 98% at temperature 95°C . At the end of each of these tests lamps are switched on at rated voltage for 2 to 3 minutes and removed from chamber. After 1 hour in normal environmental conditions the lamps are visually inspected. Lamps are considered to have passed the tests if their serviceability is preserved and base surface is free of corrosion.

- 3.12. Testing of lamps for the duration of lighting should be carried out in D.C. or AC 50Hz at rated voltage. At this stage lamps should be placed in horizontal position.

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Terminals of lamps should be placed in horizontal position. Voltage fluctuations across lamps terminals should not exceed $\pm 2\%$ rated value.

- 3.13. For transportation test (P 4.1), the lamps in container packing should be rigidly fastened to the plat form of impact stand and put to test in a mode provided in Table 8. To this end, group box is packed with 20 lamps of each type. Vacant space in the box should be filled with defective lamps.

TABLE 8

Acceleration g.	Duration of impulse ms	Quantity of impa- cts (thousands.)	No. of im- pacts /min
Vertical load			
75	4	2.0	40-80
25	10	2.0	200
10	10	8.8	200
Horizontal longitudinal of loads			
12	10	2.0	200
Horizontal-traversal loads			
12	10	2.0	200

Lamps are considered to have passed the tests for transportation if no mechanical damages are discovered by visual inspection and duration of lighting corresponds to those specified in Table 4

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3.14. Test for preservation (P 4.2) is carried out as per OST 16.0.688.059-75 according to programme mentioned in Table 9.

On completion of tests visual inspection of lamps packing . . is performed and the lamps are tested for the duration of lighting.

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TABLE 9

Group of Storage conditions	Effect of negative Temperature		Heat cyclic effect			Number of cycles	Effect of increased temperature and humidity				
	Temperature °C.	Duration of operation in hours.	(-)ve Temperature.	Positive (+) temperature	Dura- tion of opera- tion in hours		Temp- era- ture in °C.	Rela- tive humi- dity in %	Meth- od of tests	Dura- tion of opera- tion, days	
0	-50 $\pm$ 3	2	-15 $\pm$ 2	I	15 $\pm$ 2	I	5	40 $\pm$ 2	95 $\pm$ 3	Con- tinu- ous	4

NOTE: One cycle of tests corresponds to one year of storage. Lamps in cardboard packing are to be tested for 5 cycles and lamps packed in bags made of polymer film are to be tested for 8 cycles.

4. TRANSPORTATION AND STORAGE.

- 4.1. Transportation conditions of lamps should correspond to group "X" GOST B 11 19190-77. As far as the effect of climatēcal conditions is concerned according to group of storage conditions "X2" GOST B 11 19190-77.
- 4.2. Storage conditions of lamps should correspond to the group of storage conditions "C" according to GOST B 11 19190-77.

5. OPERATING INSTRUCTIONS

- 5.1. Lamps may be placed in any position in operation.
- 5.2. Operation of lamps at voltages exceeding rated values is not permitted because it shortens the duration of their lighting.
- 5.3. While mounting in the equipments lamps should be rigidly secured in corresponding holders so as not to damage the lamps.

6. MANUFACTURER'S GUARANTEE

- 6.1. Manufacturer guarantees serviceability of lamps in compliance with the requirements of present specifications, provided the user observes operating and storage conditions specified in present specifications.
- 6.2. Before use, lamps may be stored in store rooms in cardboard boxes upto 5 years and in polymer film bags upto 8 years.
- 6.3. After Storage of upto 5 years, permissible percentage of rejects is 5%, after Storage of upto 8 years — 10%.

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Appendix-1

6.3. List of documents for which references are given in present specifications.

Designation of document		Name of the document.	
1. GOST 2-601-68		Unified system of design documents and operating documents.	
2. GOST 166-80		Vernier calipers specifications.	
3. GOST 7376-77		Corrugated board specifications.	
4. GOST 14192-77		Marking of cargo.	
5. GOST 15150-69		Machines, instruments and other industrial articles. Application for different climatic regions. Categories, operating storage and transportation conditions as to environment, climatic aspect influence.	
6. GOST 16962-71		Articles of electronic and electrical engineering. Mechanical and climatic influence Test procedures and requirements.	
7. GOST 17100-79		Caps for sources of light. specifications.	
9. GOST 17516-80		Incandescent lamps procedure of measuring light and electrical parameters.	
10. GOST BA 19190-77			
11. GOST 19491-74		Laboratory balance basic parameters general technical requirements	

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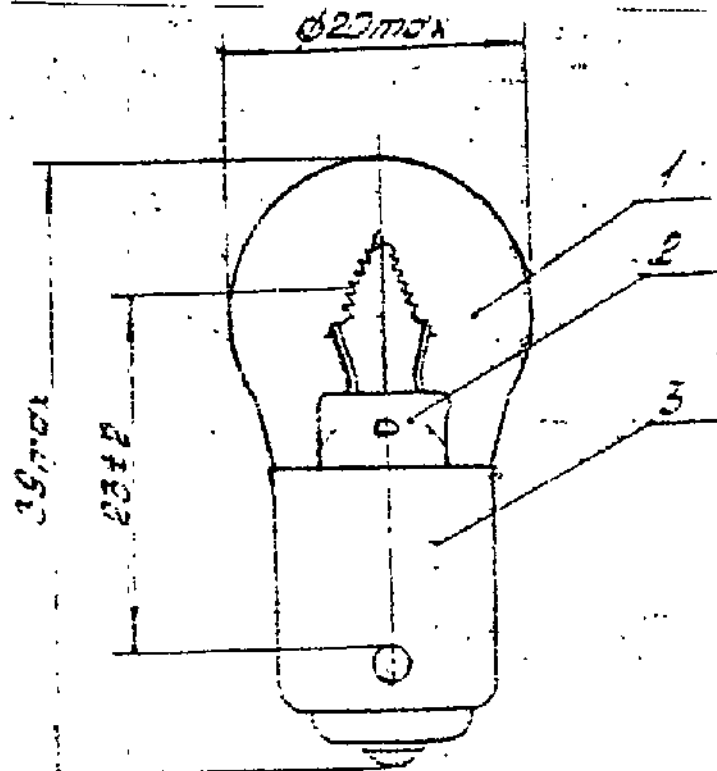
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Designation of document	Name of the document.
12. OST 16.0.688.059-75	Electrical lamps. Reliability (preservation). Technical requirements. Procedure of accelerated tests.
13. 073.371-143	Incandescent lamps for special transportation vehicles TH 28.5, TH - 28-10.
14. 073.371-144	Incandescent lamps for special transportation vehicles TH 28.40-1.
15. 133371-025	Incandescent lamps for special transport vehicles TH.28-40.

Overall and mounting dimensions, types of bases,
mass of lamps



MASS IS 10g, MAXIMUM.

1. Bulb.
2. Stem in assembly.
3. Base B 155/18 GOST 17100-79.

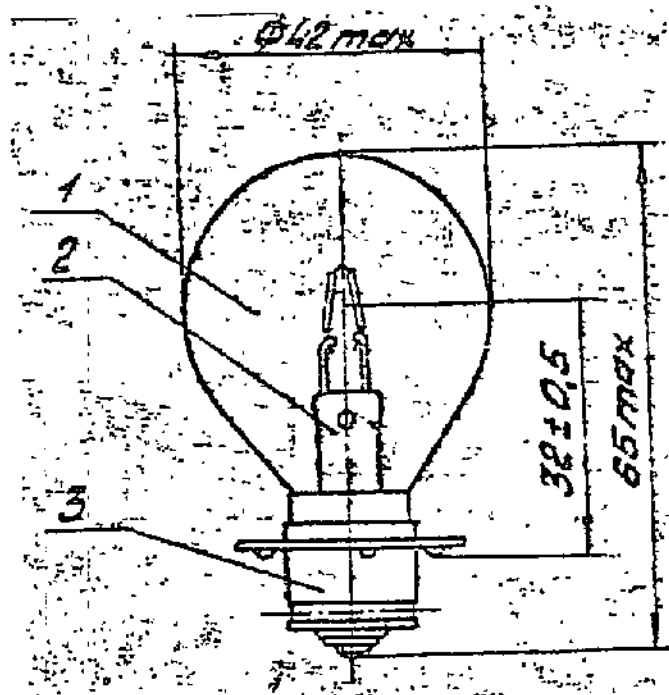
FIGURE 1. LAMPS TYPE TH 28-5; TH-28-10

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MASS IS 30g, MAXIMUM.

1. Bulb.
2. Stem in assembly.
3. Base 1φ - Д 30-1-GOST 17100-79

FIGURE-2 LAMP TYPE TH 28-40.

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1. Bulb

2. Stem in assembly.

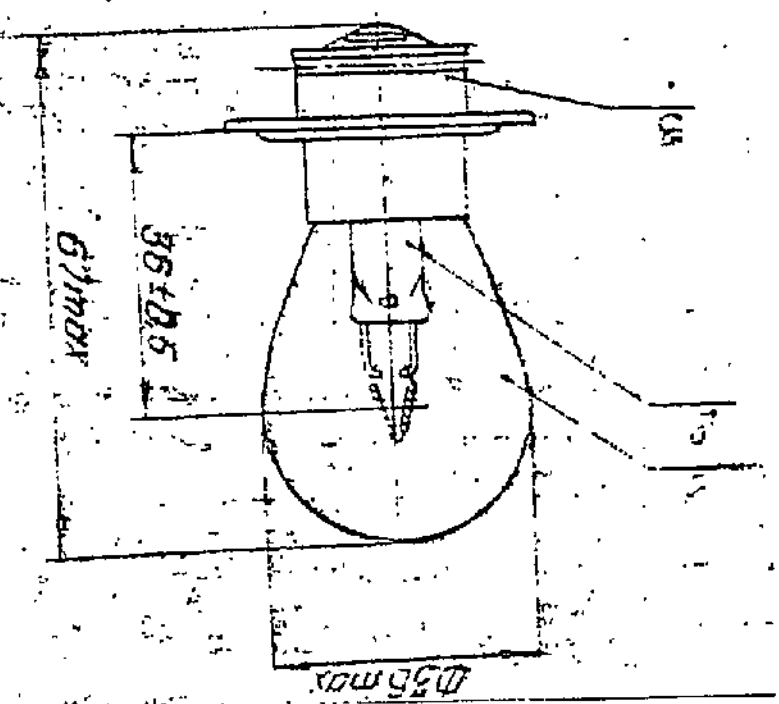
3. Base P42S/11 GOST 17100-79.

FIGURE 3 LAMP TYPE TH 28-40-1

NOTE: 1. If required by the customer base type B 15 S/18 may be replaced, by base type B15 d/18 GOST 17108-79

2. Bases of all types of lamps should be manufactured of brass with nickel coating.

MASS IS 30g, MAXIMUM.



APPENDIX 3

LIST OF EQUIPMENT RECOMMENDED FOR CHECKING AND TESTING OF

LAMPS

LAMP				16-535-853-79				29			
Name of the equipment				CLASS OF ACCURACY				DESIGNATION OF THE DOCUMENT			
1. Device for checking proper fastening of base.				0.1				Drawing.			
2. Vernier calliper				0.1				GOST 166-80			
3. Gauge				0.1				GOST 17100-79			
4. Optical device				0.1				GOST 17100-79			
5. Balance				2				GOST 19491-74			
6. Climatic test chamber				0.5				GOST 22261-76			
7. Vibration stand				0.5				GOST 22261-76			
8. Impact stand				0.5				GOST 22261-76			
9. AC Voltmeter and ammeter				0.2				GOST 22261-76			
10. DC Voltmeter and ammeter				0.2				GOST 22261-76			
11. Sphere				0.2				GOST 22261-76			
Optical device with screens on which enlarged filament is projected.				Non-standard.				Imported.			
Imported.				683,000,000				CERTIFICATE			
Imported				GOST 22261-76				GOST 22261-76			
Non standard equipment.				GOST 22261-76				GOST 22261-76			