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SUPERSEDES	

BEARINGS FOR SPECIAL PURPOSE ARTICLES

Technical specifications.

ETY - 500

1 to 20 — 24

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These technical specifications (ETY) pertain to ball, roller and hinge bearings and also to separate parts meant for special purpose articles and are supplement to GOST 520-71.

Nomenclature of bearings, balls and rollers, being supplied as per these technical specifications is specified in appendices.

Example of conventional designation of bearings and separate parts delivered as per these technical specifications when ordered and in documents where they are mentioned is the following:

Bearing 60-2214m ETY 500
~~Roller 6 x 12 ETY 500~~
Roller 1И5 x 10 AП ETY 500
Ball Б 1У 9mm H I-O -- ETY 500

1. Technical requirements

1.1 Bearings and separate parts should meet the requirements of GOST 520-71, GOST 3722-60, GOST 6870-81, GOST 7242-81, GOST 4060-78 GOST 5377-79, GOST 3635-78 and GOST 4657-81, drawings approved by developer and agreed with customer's representative, these technical specifications, standard technical documents given in the list of reference documents.

1.2 If GOSTs, standard technical documents (HTД), drawings and these technical specifications specify different requirements for one and the same parameter, bearings and separate parts should meet the requirements of these technical specifications.

1.3 Chemical composition, mechanical properties, and other characteristics of metals and materials used for manufacturing of bearings and separate parts should correspond to the standards, these ETY or Branch standard technical documents.

1.4 Hardness of bearing parts manufactured from steel ШХ 15СГ should be within the limits of HRC 61 to 64.

1.5 Surface roughness of races of rings annular, angular-contact, thrust and spherical ball bearings of all dimensions with accuracy class 0, GOST 520-71 should not exceed numerical value of roughness characteristics Ra 0.16 mkm as per GOST 2789-73.

~~Apart from bearings specified in items 2.35, 2.36, 2.37, 2.38 of these unified technical specifications,~~ Surface roughness of races rings of roller bearings of all dimensions and with accuracy class 0, GOST 520-71 should not exceed numerical value of roughness characteristic Ra 0.32 as per GOST 2789-73.

Roughness of the remaining surfaces of specified bearings and all surfaces bearings of other types and classes should be as per drawings.

1.6 Burns are not allowed on the working surfaces of rings and rolling elements of bearings.

On the mounting surfaces which reduce the hardness beyond the limits set in the technical specifications and GOST 520-71 are not allowed.

In case when it is difficult to measure the hardness of part surfaces because of their form and dimensions. The non-working surfaces of rings and rollers of bearings may leave grinding marks caused by retempering.

1.7 Cracks are not allowed on bearing parts.

1.8 Ball bearings with accuracy class 0 should be assembled with balls having degree of accuracy II accuracy class 6 and 5. With balls having degree accuracy I as per GOST 3722-60.

Annular roller bearings with short cylindrical rollers with ~~grade of fit~~ class of accuracy 0 should be assembled with rollers having degree of accuracy III A class of accuracy 6 and 5 with rollers having degree of accuracy II A as per GOST 22696-77.

1.9 Radial and axial clearances in bearings should meet the values specified in the appendices of these unified technical specifications.

1.10 Radial roller bearings with short cylindrical rollers may be delivered with races which are not obligatory interchangeable. In this case, faces of both rings should have serial number made by electrograph or by any other means.

1.11 The side faces in solid radial ball bearing should be from one side.

When manufacturing technology of ring does not specify their facing as per the edges (while processing on automatic processing line or on the machine having hopper or shop load-lifting device) checking for the axial position of bearing path is carried out from any side.

1.12 Undercut fillets of roller bearing ring collars should not have faces.

1.13 The mounting surfaces of bearings are not allowed to be chromplated.

1.14 Depth of cyanated layer of cage washers of bearings with long cylindrical and helical rollers should be withing the

limits of 0.05 to 0.2 mm. Application of cyanate layer to the external faces of cagel washers is not necessary.

1.15 The values of radial run-out axial play of a race and end play of rings of annular and angular-contact ball bearings and radial and angular-contact roller bearins with class of accuracy 0 (Marked with sign 1 in lists), should not exceed the values specified in tables 1&2.

Table 1.

Dimensions of inner rings in mkm

Standard diameters Above	up to	Variations of the width of rings	Radial run out of a race	Play of end relative to	Axial play of a race
-	30	16	10	16	32
30	50	16	12	16	32
50	80	20	16	20	40
80	120	20	20	20	40
120	180	24	24	24	48
180	250	24	32	24	48
250	315	28	40	28	56
315	400	32	48	32	64

Dimensions of outer rings in mkm Table 2

Standard diameters D. mm Above	Up to	Radial run-out of a race	Axial play of a race
	30	12	32
30	50	16	32
50	80	20	32
80	120	28	36
120	150	32	40
150	180	36	48
180	250	40	56
250	315	48	64
315	400	50	72
400	500	64	80
500	620	80	96

Remark: Axial play of inner rings should not exceed 60% of the γ values specified in table 2 if the measuring device is without a mandrel during the checking.

1.16 Value of radial runout (doubled eccentricity) of races of stiff rings of ball thrust bearings with class of accuracy o should not exceed the value specified in table 3.

Table 3.

Class of Accuracy

Standard diameters d, mm		Radial run-out doubled eccentricity or raees of shift rings.
Above	up to	
	50	40
50	120	50
120	250	60
250	315	70
315	500	80

1.17 Intermetallic inclusions (dark spots) may be allowed on the surfaces of cages made of brass ЛС59-1Л in compliance with material standards.

1.18 Tempering temperature and limits of rings and rolling element hardness, as well as suppliment conventional designations, of bearings manufactured from steel WX15(WX15W) and WX15СГ(WX15C-W) which work at increased temperature should comply with table 4.

Table 4.

Ring tempring temperature, °C	tempering of rollers	tempering of balls	Hardness HRC$_3$ of race	of rollers	of balls	Conventional designation or tempering temperature
200	is not to be carried out		61 to 64	GOST 520-71	GOST 722-60	T
225	is not to be carried out		60 to 63	GOST 520-71	GOST 3722-60	T1
250	Starting from diameter 15mm starting from diameter 25.4 mm		59 to 63	at diameter less than 15mm& above 58to 63	at dia less than 25.4mm GOST 3722-60 at diameter 25.4mm and above 58 to 63	T2
300	All dimensions		56 to 60	55to60	55to60	T3.

Remark: 1. Rolling elements may be tempered at increased temperatures on finished parts. In so doing, dullness of working surfaces is not considered to be a rejecting ~~criterion.~~ sign

2. Washers attached to the roller bearings should be tempered at the temperature at which the rings of these bearings are tempered and also should have the s ame hardness.

1.19 The rings rolling elements should not be used after repeated hardening a nd after they get overheated.

1.20 Bearing parts and separate parts should be demagnetized.

1.21 Phosphate coating of stamping cages is allowed.

2. Acceptance rules and checking procedure

2.1 The manufacturing enterprise checks all bearings in compliance with the requirements of these technical specifications, GOST 520-71, technical documents specified in lists of reference documents (Appendix 2)

2.2 Customer's representative has a right to check bearings and separate parts for compliance with the requirements of these unified technical specifications.

2.3 Checking of characteristics of rotation accuracy of bearings may be carried out as per procedures accepted at bearing manufacturing factory, provided accuracy standards set by GOST 520-71 are observed. In case of discrepancy, the result obtained after measuring as per the procedure which is set by GOST 520-71.

2.4 Measurement of geometrical parameters and checking of roughness of surfaces of bearing parts surfaces should be carried out by the technical inspection department (TID) at a working place and on discreption of TID and customer's representative, each type of dimensions of bearing parts should be submitted to the corresponding factory laboratory atleast once in a month.

2.5 Value of radial clearance of bearing is determined as arithematic mean value of three measuring with one ring being turned to 120°C.

While making a complete set and checking, minimum values of radial clearance in bearing should not go beyond the lower limit set these technical specifications.

In case when particular values go beyond upper limit the middle radial clearance of each bearing should not exceed the limits, specified in these technical specifications.

The radial clearance in the spherical roller bearings may be checked with the help of feeler gauge.

2.6 Rings of all bearing except the ring of ball bearing as per GOST 4060-78, should undergo complete inspection for notches by magnetic detection method or luminescent flow detection method. Rollers, balls and mass steel cages should undergo device, checking on magnetic detector or on the devices of ~~indestachable~~ indestructible method of inspection in confirmity with set technology at the plant.

2.7 The manufacturing factory conducts bench tests of bea rings accepted as per these unified tachnical specifications in compliance with GOST 520-71 as per the schedule approved by customer's representative at state bearing manufacturing factory.

In case of unsatisfactory results of periodical tests thorough analysis of causes of detected draw backs is carried out. Further acceptance and shipping of products should be suspended. Acceptance and shipping of products are renewed after taking measures in compliance with customer's representative to eliminate the detected drawbacks.

3. MARKING, PRESERVATION, PACKING

3.1 All bearing should have a distinct special acidic or electric chemical TID stamp confirming compliance of bearings with the requirements of these technical specifications.

The stamp should be put on the mounting surface of the bearing ring. Bearings which are without rings should have a stamp on a cage bearings having a hole diameter up to 25mm, width of ring or cage of atleast 15mm should have a stamp on the wrapper of packing box. The stamp is also put on the wrappers of boxes with separate parts. Bearings

manufacturing factory informs the articles manufacturing factories about the pattern of stamp.

3.2 Sleeve ball bearings may have marking stipulated by the drawing either on one of the rings or separately on two rings.

3.3 Split bearings with rings which are not interchageable should have serial number (applied by electrograph or by other means) on the end faces of both rings and on other split parts. Separable bearings (type 142000) should have serial numbers on the ring end faces and on the cage. The certificate and the box in which bearing are packed should have distinct inspription 'non interchangeable'.

3.4 Upon agreement with customer's representative at state bearing factory, in separate cases mark of conventional designation of a bearing, manufacturing factory and design characteristics of bearing may be applied by electrograph or chemically.

3.5 Backlogs of bearing rings which have the marking of last years production may be used in the first quarter of the next year.

Next years putout marking may be used beginning from the IV quarter of the current year.

3.6 Bearings and separate parts should be packed and preserved.

3.7 Certificate in the established form should be enclosed. in each box with packed bearins.

3.8 While preserving bearings which are delivered to the customer as per unified technical specifications 500, inhibitor "AKOP" (anticorrosive) is not to be used.

Bearings and separate parts manufactured as per these unified technical specifications may be stored for 3 months at a stockroom of the manufacturing factory. When the term gets expired, the bearings and separate parts should be subjected to represervation and at the same time an entry about new guarantee anticorrosion storage life should be made in the certificate.

4. MANUFACTURER'S GUARANTEE

4.1 The manufacturer guarantees work of 100% bearings in series articles for the service life, specified in a set order.

4.2 Preservation and package of bearing delivered as per these unified technical specifications should guarantee the protection of the bearings from corrosions for a period of 24 ~~xxxxx~~ months from the manufacturing day, prôvideed storage regulations are observed.

Appendix 2.

List of reference paper pertaining to bearings supplied according to ETY 500.

Sl. No.	Designation	DESCRIPTION
1.	GOST 520-71	Ball and roller bearings. Technical Requirements.
2.	GOST 800-78	Bearing tubes made of steel grade WX15.
3.	GOST 801-60	Ball bearing and roller bearing steel.
4.	GOST 2789-73	Surface roughness. Parameters and characterstics.
5.	GOST 3635-78	Hinge bearings. Technical specifications.
6.	GOST 3722-60	Ball bearings. Balls. Technical requirements.
7.	GOST 4060-78	Roller needle bearings with single external forged ring. Technical Requirements.
8.	GOST 5377-79	Radial roller bearings with short cylindrical rollers without inner or outer ring. Types and basic parameters.
9.	GOST 6870-81	Rolling contact bearings. Needle rollers Technical specifications.
10.	GOST 7242-81	Single-row radial ball bearings with protective washers. Types and basic parameters. Technical requirements.
11.	GOST 15527-70	Copper-zinc alloys (Brass), machineable with pressure. Grades.
12.	GOST 6267-74	Lubricant ~~ЦИАТИМ~~ ЦИАТИМ-201.
13.	GOST 9569-79	Paraffined paper.(Wax paper)
14.	GOST 10354-73	Polyethylene film.
15.	GOST 17711-72	Copper-zinc (Brass) die-casting alloys. Grades.
16.	4657-81	Single row radial needle roller bearings. Basic parameters. Technical requirements.
17.	GOST 22696-77	Rolling contact bearings. Cylindrical rollers. Technical specifications.

Appendix 3.

Bearing supplied as per ETY 500 for article 20.

Conventional designation of bearing	Class of accuracy GOST520-71	Internal clearance μ		Device for measuring clearances	Remarks
		Radial	Axial		
6-24	6	5-16	125	C-30	
6-112	6	13-33	270	P-123	
6-204	6	10-24	210	P-123	
204K	0	10-24	210	P-123	
205K	0	10-24	210	P-123	
25-207bTI	5	20-32	270	P-123	
208	0	12-26	260	P-123	
208K	0	12-26	260	P-123	
210	0	12-29	270	P-123	
60205K	0	10_24		P-123	
1210	0		120-240	A-122±10	In case if device A-122 is absent, measurements can be carried out on device ~~xx~~ 202 at the same load.
12302bI	0	20-30		See ~~CM~~. .I.15	
42205 I[1]	0	25-35			
42305M	0	25-35			
30-92224MT[1]	0	100-150		See ~~CM~~. .1.15	
92905M	0	25-35			
292208M	0			See ~~CM~~. II.5.1	
292228MT[1]	0	CM. .I.15. and 5.3			
3608	0	25-40			
4024107	GOST 4657-81			See ~~CM~~. .5.2	
6-36207	6				
308109	0				

Conventional designation of balls	Diameter of ball in mm	Manufacturer's tolerance as per GOST3722-60.		Degree of accuracy as per GOST3722-60	Remarks
		Group	Permissible deviation in mm.		
1	2	3	4	5	6
28,575mm	28,575		±0,050		

5. Supplementary technical requirements for bearings

5.1 Minimum permissible clearance between cage and edges of outer ring of bearing 292208m should be 0.3mm.

5.2 Double row spherical radial roller bearings.

Eccentricity of race (radial run out of one race with respect to the other) of inner rings with a hole diameter up to 80mm should not exceed 15μ and with hole diameter above 80 and up to 180mm should not exceed 20μ.

5.3 Bearing 292228MTI.

Dimensions of the diameter as per the rollers of assembled bearing should be within the limits of $(169 \begin{smallmatrix} + 0.065 \\ + 0.045 \end{smallmatrix})$mm.