

Date: 14.05.87.

NOTIFICATION OF AMENDMENTS TO SPECIFICATIONS

The following Corrections/Amendments are now required to be carried out in the documents as below:

Documents details : TY6-05-211-1169-78

OFPN Regr.No. : 1453

Details of amendments:-

Sl.No. Details

1. Ref : page No.3 , 2.2, first line

Delete : 'bassl'

Add : 'balls'

2. Ref : page No.7 : 5.6, first line

Delete : 'amin'

Add : 'main'

AF/PDO

'Thro AMH/PDO'

AMH/DS

Copy to: CI,ICV.

(Handwritten signature)

NUMB R TY6-05-211-1169-78

SHEET 1 OF 3

SUPERSEDES..

I 1453

APPENDIX TO

TY TECHNICAL SPECIFICATIONS

6-05-211-1169-78

SHEET 3

PLASTIC BALLS W/P -2

84/0648711

TRANSLATED	Manjira			Ordnance Factory Project Hyderabad
AUTHENTICATED	M/S KONDU	SMS	5/78	
TYPED	Saratho		6/12/85	
EDITED	MAHESH KUMAR		25/12	APPROVED
	THA	SIGN	DATE	

(Signature)

External pits, cracks and metallic inclusions are not allowed.

2.2.3 Appearance is determined as per the test samples approved by customer representative.

2.3.4 The presence of porous structure and hollows, which do not come out to external ground surface of ball, is allowed inside the balls. The internal structure of ball is not inspected/checked.

2.4 DIMENSIONS :

2.4.1 The sorting tolerance of finished bearing, balls $\mu\eta$ -2 as per variation in dimensions (size difference) in a set should not exceed 0.05mm.

2.4.2 Variation in dimensions of balls with diameter 25.4mm should be within the limits of 25.6 to 25.3mm, with diameter 12.0mm - within the limits of 11.9 to 11.7mm, with diameter 25.0mm - within the limits of 25.2 to 24.9mm, with diameter 30.6mm - within the limits of 30.36 to 30.06mm, and the

increase in sorting tolerance upto 0.15mm during storage for

6 months after acceptance by technical inspection and customer representative is considered to be detect.

2.5 Plastic balls $\mu\eta$ -2 should withstand the following load when compressed:-

Diameters of balls, mm.	Load, kgf	
	Min.	Mean value, min.
12.0	300	350
25.0	1300	1400
25.4	1400	1700
30.16	2000	2200

NOTE: Values of load indices for balls with diameter 30.16mm are optional upto the year 01.01.81.

3. ACCEPTANCE RULES.

- 3.1 Balls are submitted in sets. One set of balls includes the quantity of balls as per item 1.1 and also the additional quantity of balls required for carrying out tests as per item 2.5
- 3.2 Appearance and dimensions of balls are checked at random and with measurements by technical inspection department on 10% from a set.

SECRET/CLASSIFIED

NUMBER TY 6: P 5: 211-1169-78

SHEET 1 OF 7

SUPERSEDES..

I 1453

TY-79

ALBUM NO: 61

TECHNICAL DOCUMENT

CONVENTIONAL DESIGNATION

84/0848711-0P-40003

TY 6-05-211-1169-78

O.P.P.H: NO I-1453

TRANSLATED	R. KRISHNA	28/84
AUTHENTICATED	VICTOR	
TYPED	ROBERT	28/84
EDITED	DEBASTHAN	27/85
	NAME	DATE
	SIGN	

Ordnance Factory Project Hyderabad

APPROVED

[Signature]

Produce Factory
Project
Hyderabad.

NUMBER Ty. 6-05-211-1112

SHEET 2 OF 7

I - 1453

PLASTIC BALLS CM IT-2
TECHNICAL SPECIFICATIONS

Ty 5-05-211-1169-73

(instead of Ty 6-05-211-926-75. Ty 6-05-211-1112-77)

5-1453

Present technical specifications refer to plastic balls with 25.4 \pm 2.2 MM diameter, which are made by pressure die-casting method as per technological certificate of the manufacturing plant in concordance with the developer, with subsequent grinding.

M72 balls are meant for installation in the form of carrier in the loaded rolling bearings of big diameter with rings of mild alloys under the conditions of use ranging from minus 50 upto plus 80 $^{\circ}$ C.

In agreement with the customer, supply of separating and bearing balls of other diameters with specifications of norms of acceptance-delivery indices on the field of blue print, agreed with the manufacturer is permitted.

1. COMPLETE SET.

1.1 Plastic balls are supplied in complete sets the size of the sets is specified in the supply agreement.

2. TECHNICAL SPECIFICATIONS

2.1 Plastic balls should meet the requirements of present technical specifications.

2.2 For the manufacture of the bearing ^{balls} copolymer of tri-oxane with dioxane mark CT A-30C and CT A 30CN and formaldehyde with dioxane mark ^{30CN} CT A 30C are used for the manufacture of the separating balls painted copolymer of the same marks are used.

Colour of the copolymer is not specified

2.3 Appearance

2.3.1 Balls of unpainted copolymers should have grey beige colour of various shades. There may be silver shade and marbleness that is typical for the initial material.

2.3.2 On the surface of the balls the following is allowed:

I-1453

- dot defects formed during grinding not more than 3 pieces on one ball;
- dark spots maximum 3MM, numbering 4 pieces on one ball.
- strips aurôle around the gate.

External cavities cracks and metallic inclusions are not allowed.

2.3.3 Appearance is determined according to standard pieces agree with customer representative.

balls

2.3.4 It is allowed inside the ~~ball~~ presence of sponge structure hollowness, which does not come out on the outer grinded surface of the ball. Internal structure of the ball is not checked.

2.4 - Dimensions.

2.4.1 Sorting allowance of the ready bearing and separating balls M7-2 is per the different dimensions in the set should not exceed 0.05MM.

2.4.2 Change of the dimensions of balls with 25.6MM diameter in the limits of 25.6-25.3MM and increase of sorting allowance upto 0.15MM in the process of storage for 6 months after the acceptance by technical inspection and by customer representative is not the basis for rejection.

2.5 Plastic balls M7-2 should withstand the following load during the compression.

Diameter of the ball MM	Load Kgf
-------------------------	----------

Minimum	Medium value minimum
---------	----------------------

3. ACCEPTANCE RULES.

3.1 Balls are presented in sets. Set consists of number of balls as per item 1.1 and further additional number of balls required for conducting the tests as per item 2.5

I-1453

3.2 Check of the appearance and dimensions of balls are carried out by technical inspector who selects at random 10% from the set measuring diameters of balls by micrometer or other measuring instruments of balls by micrometer or other measuring instrument securing the accuracy upto 0.01MM.

3.3 Test for breaking load effect during compression is carried out selectively testing 40% from the set by not less than 6 articles. During the repeated tests double number of balls are to be taken.

3.4 Acceptance of the balls is carried out by TID representative of manufacturing plant and customer representative.

3.5 If the results of repeated tests do not meet the requirements of item 2.5 of present technical specifications the whole set is rejected.

4. CHECKING METHODS.

4.1 Checking of outward appearance is carried out by visual inspection comparing with the standard piece.

4.2 Check of dimensions of the balls is carried out at temperature 18-25°C not less than 24 hours after treatment if the latter is specified in the technical documents.

4.3 Determining of the breaking load the effect during compression is carried out in the direction perpendicular to casting on any testing machine with a scale factor of maximum 20 kgf. with a speed at idle run of supporting plate of machine in the limits of 1-2MM/minute.

25.4MM diameter balls are tested in metallic chutes of 14MM radius in this case the ball is installed in such a way that the axis of the chutes are parallel to the direction of the casting.

In case of random test if the balls do not meet the requirements of item 2.5 of present technical specifications the double number of balls out of those which have already tested are added to the set, and after which doubled numbers of balls are selected from the set (8% from the set, but not less than 12 pieces) for carrying out the repeated test. If the values of the breaking loads meet the requirements of present technical specifications during the repeated tests of balls the set is considered fit.

Balls subjected to the test are selected by the customer representative who marks the place of application of load on the balls.

5. PACKAGE, MARKING, TRANSPORTATION AND STORAGE.

5.1 Plastic balls are transported by any mode of transport under conditions, securing safety from the effect of humidity and mechanical damages.

5.2 For the installation in the assembly units the balls are stored completely with the consumer in package of manufacturer in closed warehouses at a temperature not below 5°C and a relative humidity of air-70%.

5.3 Each package of the balls is carried out completely in special bags made from cloth. Marking up the complete set should meet the requirements of item 1.1 of present technical specifications.

5.4 A Document about quality is enclosed in each bag with packed balls with the stamp of manufacturing enterprise, and the document of the customer representative of the manufacturing plant.

5.5 The document about quality specified the following:

Material name

Actual maximum and minimum dimensions of balls with an accuracy upto 0.01mm

Determined on the day of accepting the balls;

Number of the set;

Manufacturing date;

Results of the tests of balls against the breaking load during compression.

