# TECHNICAL
# REPORT

# ISO/TR
# 9274

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## Rolling bearings — Measuring and gauging principles and methods

*Roulements — Principes et méthodes de mesurage et de vérification par calibres*

# Contents

# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The main task of ISO technical committees is to prepare International Standards. In exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 9274, which is a Technical Report of type 3, was prepared by Technical Committee ISO/TC 4, *Rolling bearings,* Sub-Committee SC 4, *Tolerances.*

This Technical Report is issued for the guidance of those wishing to use the measuring and gauging methods described. The Technical Committee does not envisage that it will become an International Standard.

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# Rolling bearings — Measuring and gauging principles and methods

## 1. Scope

This Technical Report establishes guidelines for measurement of dimensions, running accuracy and internal clearance of rolling bearings. The purpose is to outline the fundamentals of various measuring and gauging principles which may be used in order to comply with the definitions of ISO 1132 and ISO 5593.

The measuring and gauging methods described in this Technical Report do differ amongst themselves and do not provide for a unique interpretation of requirements of ISO 1132 and ISO 5593. It is recognized that there are other adequate measuring and gauging methods and that technical development may result in even more convenient methods. Therefore, this Technical Report does not imply any obligation to apply any particular method. However, the methods specified may be referred to in cases of dispute.

This Technical Report covers both radial and thrust rolling bearings.

## 2. References

ISO 1 - 1975     Reference temperature

ISO 1132 - 1980 Rolling Bearings - Tolerances - Definitions

ISO 5593 - 1984 Rolling Bearings - Vocabulary

## 3. Definitions

Measurement:  A set of operations having the object of determining the dimension(s) or variation of a feature.

Gauging:  An act of inspecting a size and/or form by means of a gauge.

Measuring and gauging principle: Fundamental geometrical basis for the measurement or gauging of the considered geometrical characteristic.

Measuring and gauging method: Practical application of the principle by the use of different equipment and operations.

<u>Measuring equipment</u>:  Technical device necessary for a specific method (e.g. calibrated indicator).

<u>Gauge</u>:  A device of defined geometric form and size used to assess the conformance of a feature of a workpiece to a dimensional specification. The device could give only "go"  and/or "no go" information (e.g. plug gauge).

<u>Measuring force</u>:  The force applied by the stylus of an indicator or a recorder to the feature being measured.

NOTE - Definitions of tolerance concepts applied in this Technical Report are given in ISO 1132.

<u>Reference face</u>: Face so designated by the manufacturer of bearings and which may be the datum for measurements.

NOTE - The reference face for the measurement of a ring is generally taken as the unmarked face.
In case of symmetrical rings when it is not possible to identify the reference face, the tolerances are deemed to comply relative to either face.
The reference face of a shaft and housing washer of a thrust bearing, is that face intended to support axial load and is generally opposite the raceway face.
In the case of single row angular contact ball bearing rings and tapered roller bearing rings the reference face is the "back face" which is intended to support axial load.
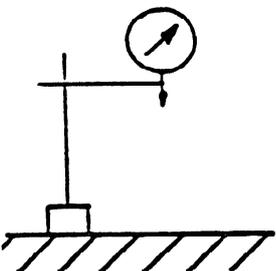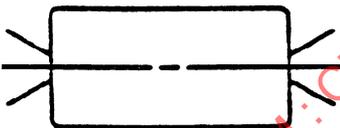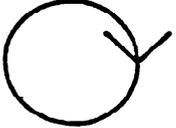
4. <u>Symbols</u>

The tolerance symbols used in this Technical Report are in
accordance with ISO 1132.

The symbols shown in Table 1 are applied throughout this
Technical Report.

Table 1

| | Symbol | Interpretation |
|---|---|---|
| 1 | | Surface plate (measuring plane) |
| 2 | | Fixed support |
| 3 | | Indicator or recorder |
| 4 | | Measuring stand with indicator or recorder. Symbols for measuring stands can be drawn in different ways in accordance with the measuring equipment used. |
| 5 | | Centred arbor |
| 6 | | Intermittent linear traverse |
| 7 | | Intermittent turning |
| 8 | | Rotation |
| 9 | | Loading, direction of loading |
| 10 | | Loading alternately in opposite directions |
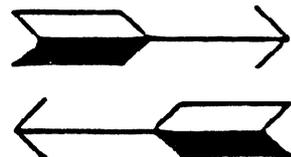
## 5. General Conditions

### Measuring equipment

Measurements of the various dimensions and runouts can be performed on different kinds of measuring equipment and with different degrees of accuracy. In this Technical Report methods are described which are commonly used by bearing users and which, as a rule, provide an accuracy sufficient for practical purposes. It is recommended that the total measuring inaccuracy should not exceed 10% of the actual tolerance zone.

However, the measuring and gauging methods may not always fully check the indicated requirements. Whether or not such methods are sufficient and acceptable depends on the magnitude of the actual deviations from the ideal dimension and form and inspection circumstances.

Bearing manufacturers frequently use specially designed measuring equipment for individual components, as well as assemblies, to increase the speed and accuracy of measurement. Should the dimensional or geometrical errors appear to exceed those in the relative specifications, when using equipment as indicated in any of the principles in this Technical Report, the matter shall be referred to the bearing manufacturer.

### Masters and indicators

Determination of dimensions is performed by comparing the actual part with appropriate gauge blocks or masters whose calibration is traceable to those used by National Standards Organizations. For such comparison an indicator, calibrated and of appropriate sensitivity, is used.

### Arbors

In all cases when arbor methods of measuring of runout are used, the rotational accuracy of the arbor should be determined so that subsequent bearing measurements may be suitably corrected for any appreciable arbor inaccuracy.

### Temperature

Before measurement is made, the part to be measured, the measuring equipment and the master should be brought to the temperature of the room in which the measurements are to be made. Care should be used to avoid heat transfer to the part or assembled bearing during measurement. Recommended room temperature is + 20° C.

Measuring force and radius of measuring stylus

To avoid undue deflection of thin rings, measuring force should be
minimized and if significant distortion is present, a load
deflection factor shall be introduced to correct the measured
value to the free unloaded value.

For measuring force and radius of measuring stylus see Table 2.

Table 2

| Bearing feature | Nominal size range mm | | Measuring force N | Radius of measuring stylus mm |
|---|---|---|---|---|
| | over | incl. | max. | min. |
| Bore diameter d | – | 10 | 2 | 0.8 |
| | 10 | 30 | 2 | 2.5 |
| | 30 | – | 3.5 | 2.5 |
| Outside diameter D | – | 30 | 2 | 2.5 |
| | 30 | – | 2.5 | 2.5 |

Coaxial measuring load

To maintain the bearing parts in their proper relative positions
the coaxial measuring load in tables 3 and 4 shall be applied for
methods 8.2.1.1, 8.3.1.1, 8.4.1.1, and 8.5.1.1.

Table 3   - Coaxial measuring loads for groove type ball bearings

| Nominal size range of the bearing outside diameter mm | | Coaxial load on the bearing N |
|---|---|---|
| over | incl. | min. |
| – | 30 | 5 |
| 30 | 50 | 7.5 |
| 50 | 80 | 15 |
| 80 | 120 | 35 |
| 120 | 180 | 70 |
| 180 | – | 140 |

Table 4 - Coaxial measuring loads for tapered roller bearings

| Nominal size range of the bearing outside diameter mm | | Coaxial load on the bearing N |
|---|---|---|
| over | incl. | min. |
| – | 30 | 40 |
| 30 | 50 | 80 |
| 50 | 80 | 120 |
| 80 | 120 | 150 |
| 120 | – | 150 |

## Measurement zone

The limits for deviations of a bore diameter or an outside diameter are not applicable to measurements in radial planes situated at a distance of less than $1.2\ r_{smax}$ from the side faces of the bearing rings.

## Preparation before measuring

Any grease or corrosion inhibitor adhering to the bearings shall be removed if it is likely to affect the measurement results. Before measuring, the bearings should be lubricated with a low viscosity oil.

NOTE - Immediately after completion of the measurements the bearings should be coated with a corrosion inhibitor.

## 6. Measuring and gauging principles and methods

For each characteristic to be measured or gauged one or more measuring or gauging principles are indicated in Clauses 7 and 8. For each principle one or more measuring or gauging methods are given.

The left hand columns entitled "Method" show:

- the number of the method
- a figure illustrating the method
- essential characteristics of the method
- the readings to be taken
- required repetitions

The right hand columns entitled "Comments" are used for supplementary information, for example:
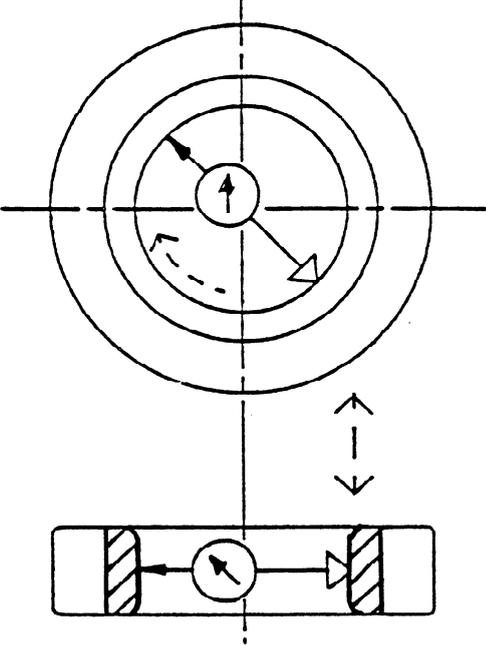
- a particular application
- any restrictions in application
- any particular sources of error
- any particular requirements as to equipment
- examples of equipment
- treatment of readings obtained

It should be noted that consideration has neither been given to the influence of the accuracy and design of the measuring equipment, nor to the skill of the operator. These factors sometimes have a greater influence on the result of the measurement or gauging than the difference between the methods described.
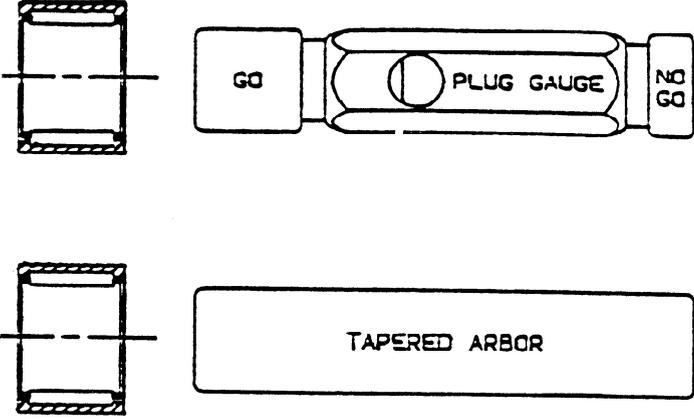
The measuring and gauging principles and methods are not illustrated in detail and are not intended for application on end-product drawings.

The numbering of measuring and gauging principles and methods shall not be regarded as a classification of priority within the prescribed type of tolerances.
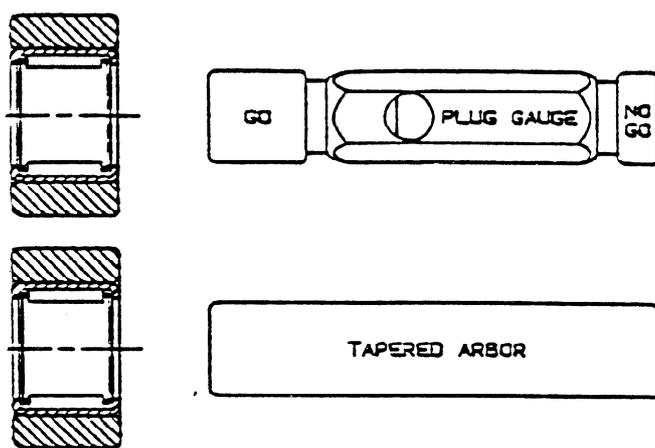
7.      Inner and outer rings, shaft and housing washers.
7.1     Bore diameter - d.
7.1.1   Principle 1.  Two-point measurement of bore diameter.

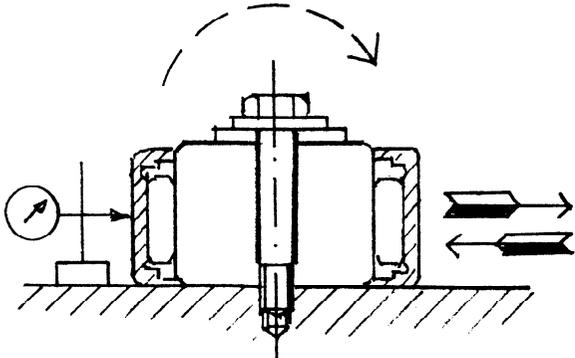| METHOD | COMMENTS |
|---|---|
| 7.1.1.1 <br><br>Use device arranged for two-point bore measurements.<br>Measure single bore diameters in several angular directions and also in several radial planes. In this manner the smallest and the largest single diameter of the bore surface is obtained.<br>Also, when required, the smallest and largest single diameter in each radial plane is determined, from which the diameter variation in a single radial plane, the mean diameter in each radial plane and the variation of the mean diameter from plane to plane are obtained. | If the size or section of the bearing inner ring is such that, with the bearing axis in a horizontal position, the bore measurement is influenced by gravity, the bearing should be placed with the axis in a vertical position and, if necessary, use a lower measuring force.<br><br>$$\Delta_{ds} = d_s - d$$<br>$\Delta_{ds}$ = deviation of single bore diameter<br><br>d = nominal bore diameter<br><br>$$\Delta_{dmp} = d_{mp} - d$$<br>$\Delta_{dmp}$ = single plane mean bore diameter deviation.<br><br>$$d_{mp} = \frac{d_{smax} + d_{smin}}{2}$$<br>NOTE - in a single radial plane<br><br>$$V_{dp} = d_{smax} - d_{smin}$$<br>$V_{dp}$ = bore diameter variation in a single radial plane<br><br>$$V_{dmp} = d_{mpmax} - d_{mpmin}$$<br>$V_{dmp}$ = mean bore diameter variation (applies only to basically cylindrical bore). |

7.2    Roller complement bore diameter.
7.2.1   Principle 1.  Functional gauging of roller complement bore
        diameter with outer ring free.

| METHOD | COMMENTS |
|---|---|
| 7.2.1.1 <br><br><br><br><br><br>The roller complement bore diameter is gauged with "GO" and "NO GO" plug gauges or with a calibrated tapered arbor.<br><br>The "GO" plug gauge size is smaller than the roller complement minimum bore diameter by 2 micrometres.<br>The "NO GO" plug gauge size is larger than the roller complement maximum bore diameter by 2 micrometres. | This method is used for gauging of the roller complement bore diameter of bearings with machined outer ring. |

7.2.2  Principle 2.  Functional gauging of roller complement bore
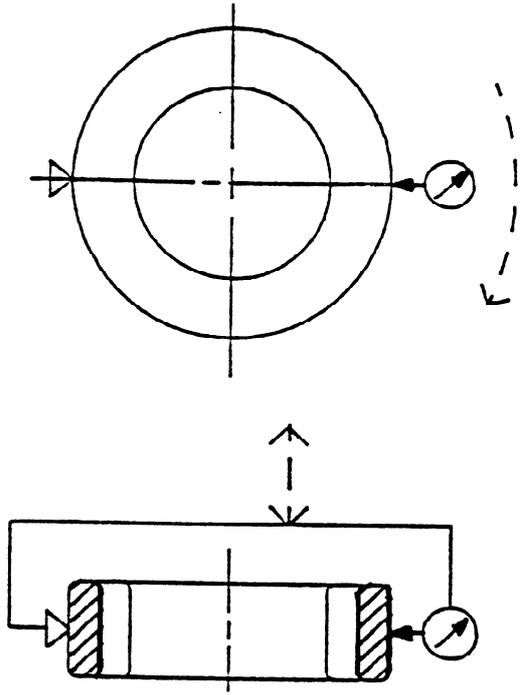       diameter with outer ring constrained.

| METHOD | COMMENTS |
|---|---|
| 7.2.2.1 | This method is used for gauging of the roller complement bore diameter of bearings with a drawn cup outer ring. |



First press the bearing into a hardened
steel ring gauge of specified bore
diameter. The recommended minimum
radial section of the ring gauge is
given in Table 5. The roller complement
bore diameter is then gauged with "GO"
and "NO GO" plug gauges or with a
calibrated tapered arbor.

The "GO" plug gauge size is smaller
than the roller complement minimum
bore diameter by 2 micrometres.
The "NO GO" plug gauge size is larger
than the roller complement maximum bore
diameter by 2 micrometres.

Table 5

| Ring gauge bore diameter | | Ring gauge radial section |
|---|---|---|
| mm | | mm² |
| Over | Incl. | min. |
| 5.0 | 9.0 | 9.5 |
| 9.0 | 13.0 | 11.1 |
| 13.0 | 16.1 | 14.3 |
| 16.1 | 38.4 | 17.5 |
| 38.4 | 51.0 | 20.6 |
| 51.0 | 63.8 | 22.2 |
| 63.8 | 89.2 | 25.4 |
| 89.2 | 101.9 | 28.6 |

7.2.3   Principle 3.  Measurement of roller complement bore diameter
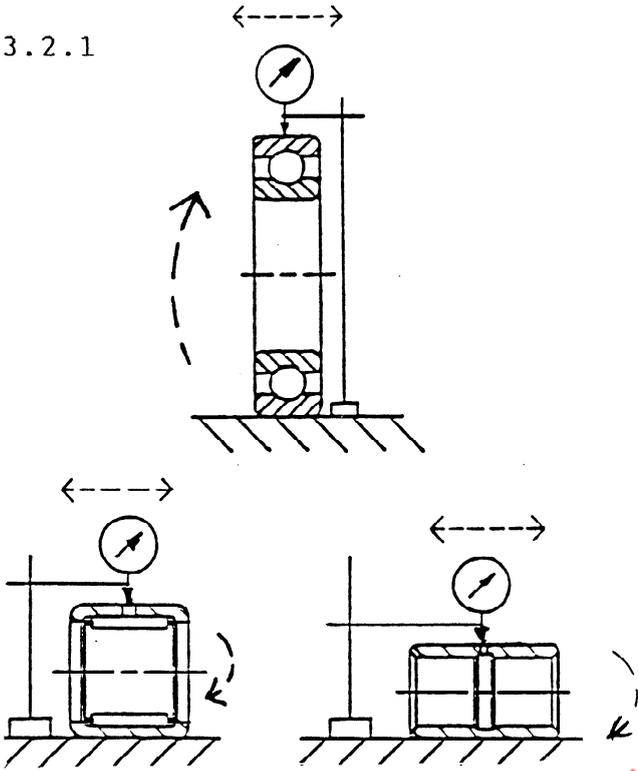        by measurement of radial displacement over a master gauge.

| METHOD | COMMENTS |
|---|---|
| 7.2.3.1<br><br><br><br>Fasten the master gauge on a surface plate.<br>Set the bearing on the master gauge and apply the indicator to the middle of the outer ring width in the radial direction.<br><br>Apply sufficient radial load alternately on the outer ring in the same radial direction as that of the indicator.<br>Take indicator readings at the extreme radial positions of the outer ring.<br>Repeat the measurement on the outer ring and the rollers on different angular positions.<br>Bore diameter will equal the average of the above readings plus the master gauge diameter. | This method is used for measurement of the roller complement bore diameter of cylindrical roller bearings and needle roller bearings. |

7.3    Outside diameter - D.
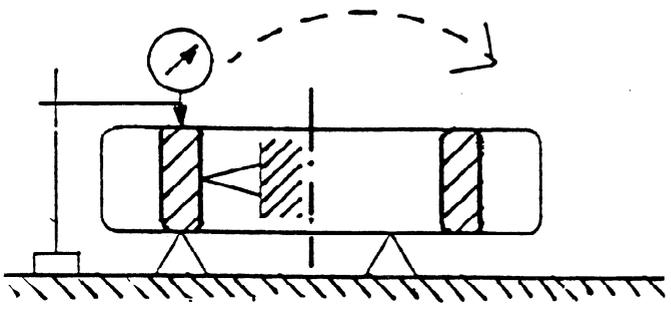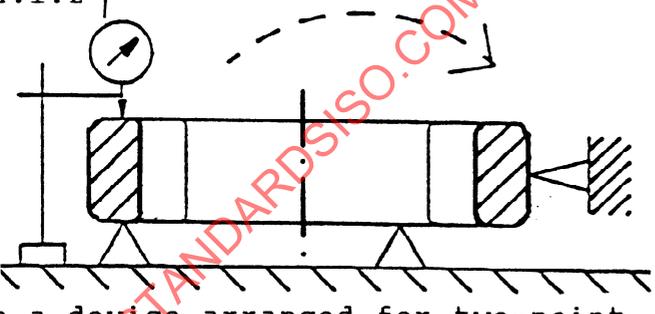7.3.1    Principle 1.    Two-point measurement of outside diameter.

| METHOD | COMMENTS |
|---|---|
| 7.3.1.1  Use device arranged for two-point outside diameter measurements. Measure single outside diameters in several angular directions and also in several radial planes. In this manner the largest and the smallest single diameter of the outside surface is obtained. Also, when required, the largest and the smallest single diameter in each radial plane is determined, from which the diameter variation in a single radial plane, the mean diameter in each radial plane and the variation of the mean diameter from plane to plane are obtained. | If the size or section of the bearing outer ring is such that, with the bearing axis in horizontal position, the outside diameter measurement is influenced by gravity, the bearing should be placed with the axis in a vertical position and, if necessary, use a lower measuring force. $$\triangle_{Ds} = D_s - D$$ $\triangle_{Ds}$ = deviation of a single outside diameter $D$ = nominal outside diameter $$\triangle_{Dmp} = D_{mp} - D$$ $\triangle_{Dmp}$ = single plane mean outside diameter deviation $$D_{mp} = \frac{D_{smax} + D_{smin}}{2}$$ NOTE - in a single radial plane $$V_{Dp} = D_{smax} - D_{smin}$$ $V_{Dp}$ = outside diameter variation in a single radial plane $$V_{Dmp} = D_{mpmax} - D_{mpmin}$$ $V_{Dmp}$ = mean outside diameter variation (applies only to basically cylindrical outside surface). |

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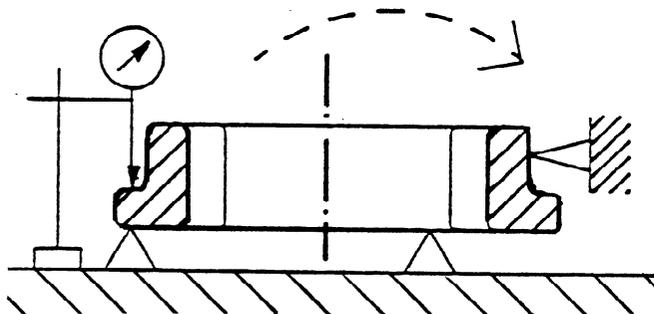7.3.2  Principle 2.  Measurement of distance of outside diameter.

| METHOD | COMMENTS |
|---|---|
| 7.3.2.1 <br><br>The bearing is placed on a surface plate and the distance between this surface and various points on the outer ring outside surface are measured by means of an indicator.<br><br>Measurement shall be made with the ring in several angular directions and also in several radial planes. In this manner the largest and the smallest single diameter of the entire outside surface is obtained. Also, when required, the largest and the smallest single diameter in each radial plane is determined, from which the diameter variation in a single radial plane, the mean diameter in each radial plane and the variation of the mean diameter from plane to plane are obtained. | If the size or section of the bearing outer ring is such that, with the bearing axis in a horizontal position, the outside diameter measurement is influenced by gravity, the bearing should be placed with the axis in a vertical position and, if necessary, use a lower measuring force.<br><br>$\triangle_{Ds} = D_s - D$<br><br>$\triangle_{Ds}$ = deviation of a single outside diameter<br><br>$D$ = nominal outside diameter<br><br>$\triangle_{Dmp} = D_{mp} - D$<br><br>$\triangle_{Dmp}$ = single plane mean outside diameter deviation<br><br>$D_{mp} = \dfrac{D_{smax} + D_{smin}}{2}$<br>NOTE - in a single radial plane<br><br>$V_{Dp} = D_{smax} - D_{smin}$<br><br>$V_{Dp}$ = outside diameter variation in a single radial plane<br><br>$V_{Dmp} = D_{mpmax} - D_{mpmin}$<br><br>$V_{Dmp}$ = mean outside diameter variation (applies only to basically cylindrical outside surface).<br><br>As this is not a two-point method of measurement, some loss of accuracy may be encountered relative to the accuracy required and Principle 1 is the preferred method. |

7.4 Ring width – $B_s$, $C_s$ – and flange width – $C_{1s}$.
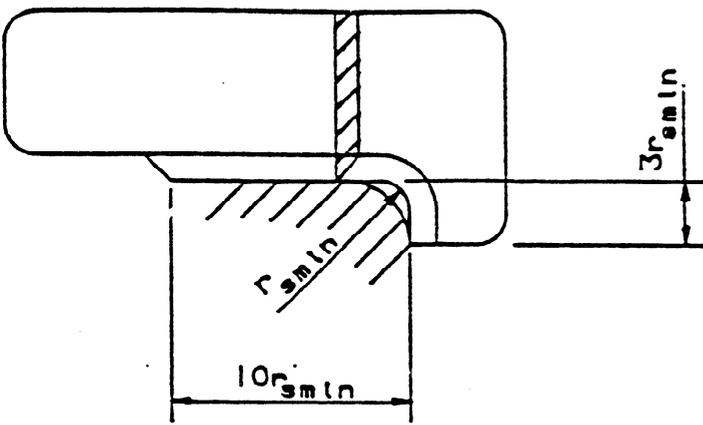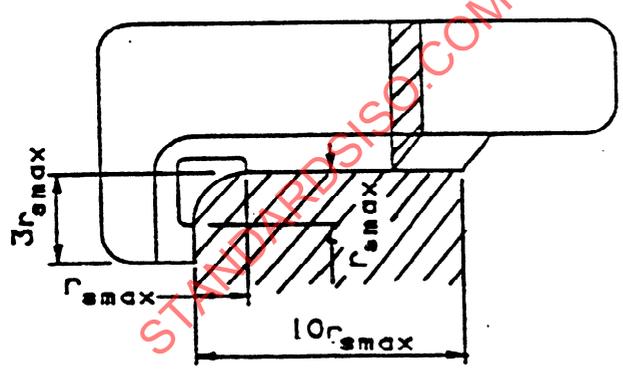7.4.1 Principle 1. Two-point measurement of inner and outer
      ring width.

| METHOD | COMMENTS |
|---|---|
| **7.4.1.1**<br><br><br><br>Use a device arranged for two-point width measurements.<br>Support one face of the inner ring on three equally spaced fixed supports of known equal heights and provide suitable supports to centre the ring.<br>Position the indicator against the other face of the inner ring opposite one fixed support.<br>Use a gauge block of specified size for zero setting of the indicator.<br>Rotate the inner ring one revolution and measure the inner ring width. | $\triangle_{Bs} = B_s - B$<br><br>$\triangle_{Bs}$ = deviation of single inner ring width<br><br>$B$ = nominal inner ring width<br><br>$V_{Bs} = B_{smax} - B_{smin}$<br><br>$V_{Bs}$ = inner ring width variation |
| **7.4.1.2**<br><br><br><br>Use a device arranged for two-point width measurements.<br>Support one face of the outer ring on three equally spaced fixed supports of known equal heights and provide suitable supports to centre the ring.<br>Position the indicator against the other face of the outer ring opposite one fixed support.<br>Use a gauge block of specified size for zero setting of the indicator.<br>Rotate the outer ring one revolution and measure the outer ring width. | $\triangle_{Cs} = C_s - C$<br><br>$\triangle_{Cs}$ = deviation of single outer ring width<br><br>$C$ = nominal outer ring width<br><br>$V_{Cs} = C_{smax} - C_{smin}$<br><br>$V_{Cs}$ = outer ring width variation |

## 7.4.1 Principle 1. Two-point measurement of flange width.

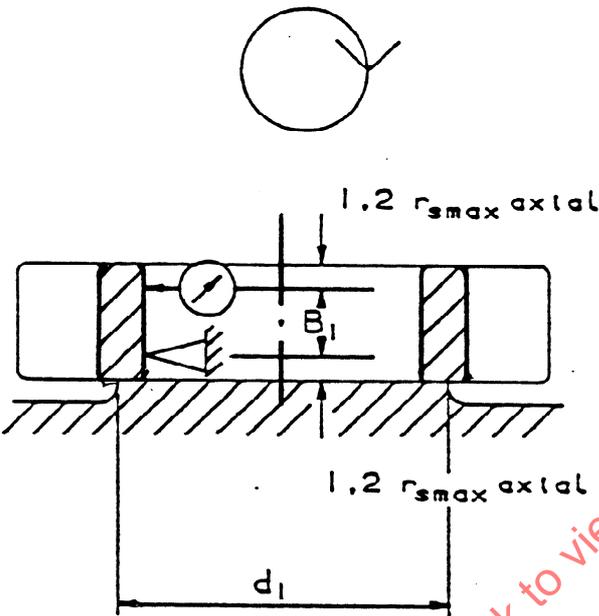| METHOD | COMMENTS |
|---|---|
| 7.4.1.3  Support the outer ring on the flange side face on three equally spaced fixed supports of known equal heights and provide suitable supports to centre the ring. Position the indicator against the face of the flange opposite one fixed support. Use a gauge block of specified size for zero setting of the indicator. Rotate the outer ring one revolution and measure the flange width. | $$\Delta_{C1s} = C_{1s} - C_1$$ $\Delta_{C1s}$ = deviation of a single outer ring flange width $C_1$ = nominal outer ring flange width $$V_{C1s} = C_{1smax} - C_{1smin}$$ $V_{C1s}$ = outer ring flange width variation |

7.5    Chamfer dimensions - $r_s$.

7.5.1  Principle 1.  Gauging chamfer dimensions by comparison with a template.
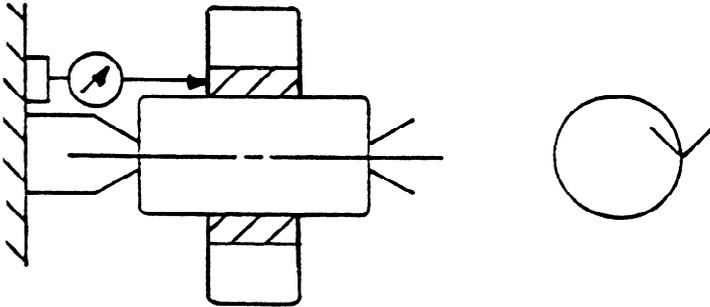
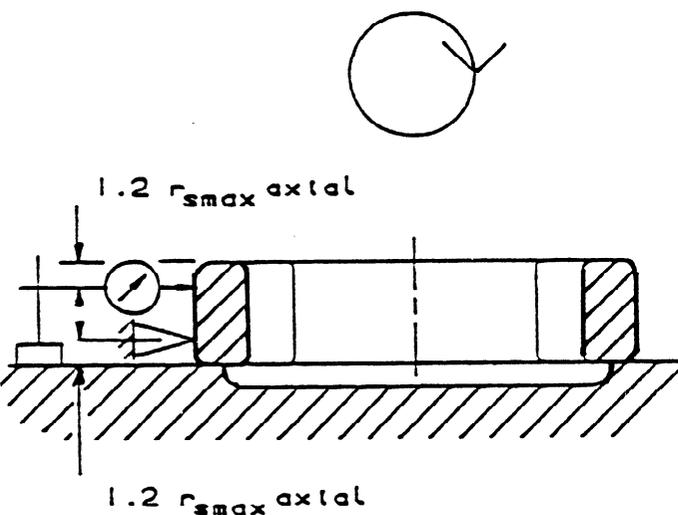| METHOD | COMMENTS |
|---|---|
| **7.5.1.1**<br><br><br><br>Place the minimum chamfer template on the ring. Contact between chamfer surface and template should not prevent template from resting on both the bore or outside surface and the side face of the ring.<br><br><br><br>Place the maximum chamfer template on the ring. Compare the ring chamfer dimension with the markings of the template. | If the template is prevented from resting on both the bore or outside diameter and the side face of the ring, it is a "NO GO" situation. |

7.6    Face runout with bore - $S_d$.
7.6.1   Principle 1.   Measuring distance variation of face runout with bore from a fixed point during rotation by supporting the face and the bore generatrix.

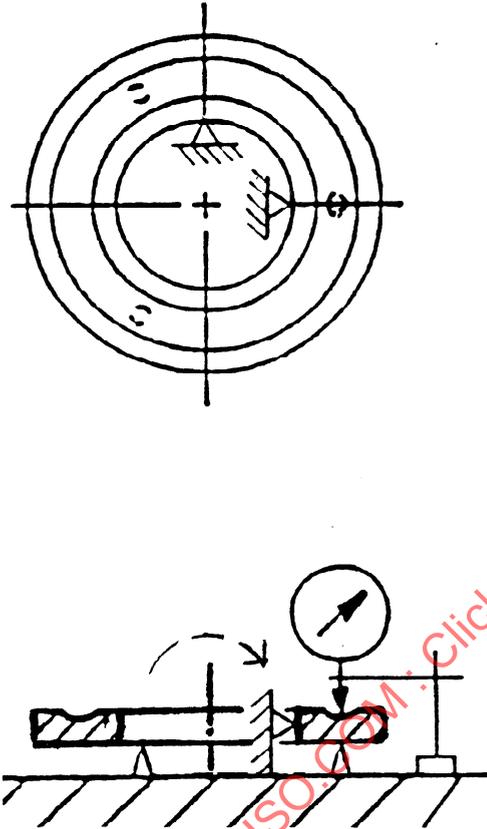| METHOD | COMMENTS |
|---|---|
| 7.6.1.1 <br><br>  <br><br> Support the inner ring reference face (or back face) on a surface plate leaving the outer ring free and locate the inner ring bore surface against two supports set at 90° to each other. Position an indicator directly above one support. Take indicator readings, while rotating the inner ring one revolution and multiply the difference between the largest and smallest readings by the ratio $d_1/2B_1$ to give reference face (or back face) runout with bore - $S_d$. <br><br> Applies when: <br><br> $$\frac{d_1}{2\,B_1} \leq 2$$ <br><br> $d_1$ = inner ring raceway contact diameter <br><br> $B_1$ = The axial distance between the indicator and stop directly below it. | This measurement defines bore runout with reference face and is converted to face runout with bore by a multiplication factor. <br><br> If the method is not practical relative to the equipment available use the alternative, Principle 2. |

7.6.2   Principle 2.   Measuring distance variations of face runout with
        bore from a fixed point during rotation around the bore axis.

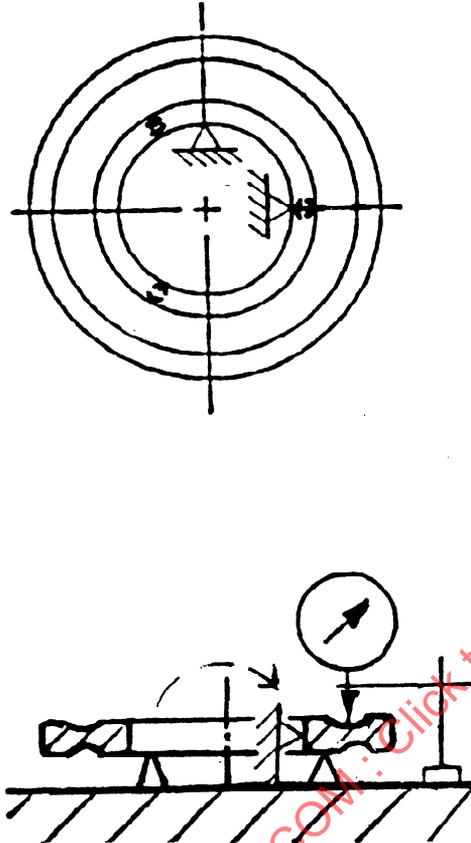| METHOD | COMMENTS |
|---|---|
| **7.6.2.1** <br><br> Use a precision arbor device arranged for face runout measurement. Mount the bearing assembly on a tapered arbor and place the arbor between two centres so that it can be accurately rotated. Set the indicator against the reference face (or back face) of the inner ring at a radial distance from the arbor axis to be approximately equal to the mean raceway diameter. Take indicator readings while rotating the inner ring one revolution. Face runout with bore – $S_d$ – is the difference between the largest and smallest indicator readings. | |

7.7    Variation of outside surface generatrix inclination with face - $S_D$.
7.7.1  Principle 1.  Measurement of distance variation of outer
       diameter with face from a fixed point during rotation by
       supporting the face and the outside surface generatrix.

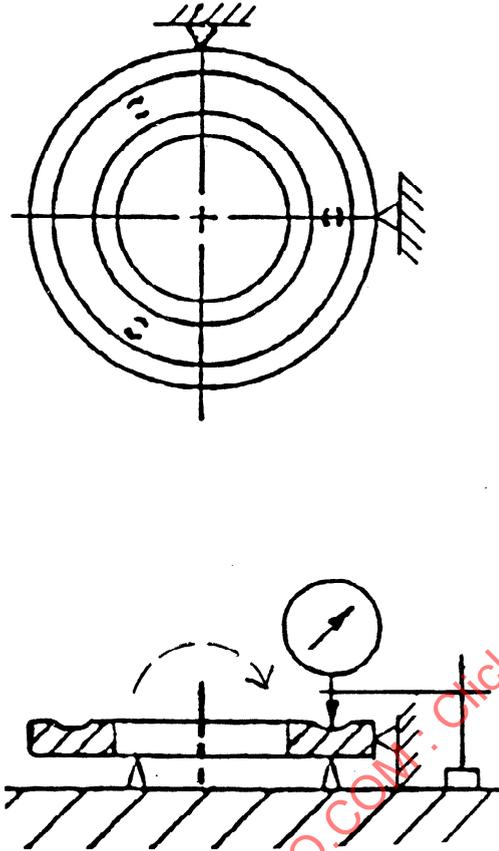| METHOD | COMMENTS |
|---|---|
| 7.7.1.1<br><br>I.2 $r_{smax}$ axial<br><br>I.2 $r_{smax}$ axial<br><br>Support the reference face (or back face) of the outer ring on a surface plate leaving the inner ring free and locate the outside cylindrical surface against two fixed supports set at 90° to each other.<br>Position an indicator directly above one fixed support and rotate the outer ring one revolution.<br>Variation of the outside surface generatrix inclination with face - $S_D$ - is the difference between the largest and smallest indicator readings. | |

7.8    Thickness variation of thrust bearing washer – $S_i$, $S_e$.

7.8.1  Principle 1. Two point measurement of thickness variation
       between the back face and the raceway of shaft washer.

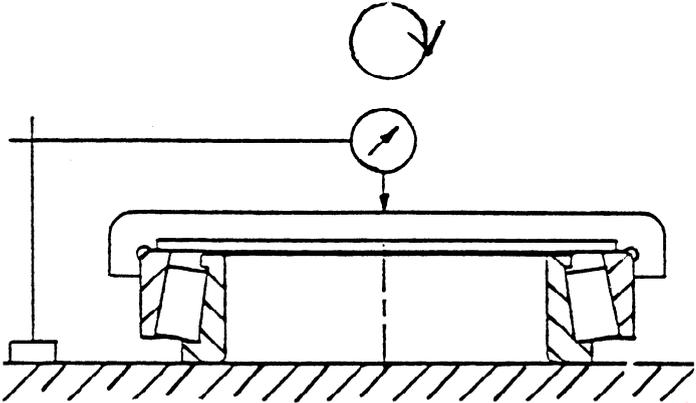| METHOD | COMMENTS |
|---|---|
| 7.8.1.1 <br><br>  <br><br> shaft<br>washer <br><br> Support the back face on three equally spaced fixed axial supports of equal heights and provide suitable fixed radial supports in the bore as illustrated. <br><br> Position the indicator against the middle of the raceway opposite one fixed support and rotate the washer one revolution. The thickness variation–$S_i$–is the difference between the largest and the smallest indicator readings. | |

## 7.8.1 Principle 1. Two point measurement of thickness variation between the flat face and the opposite raceway of central washer.

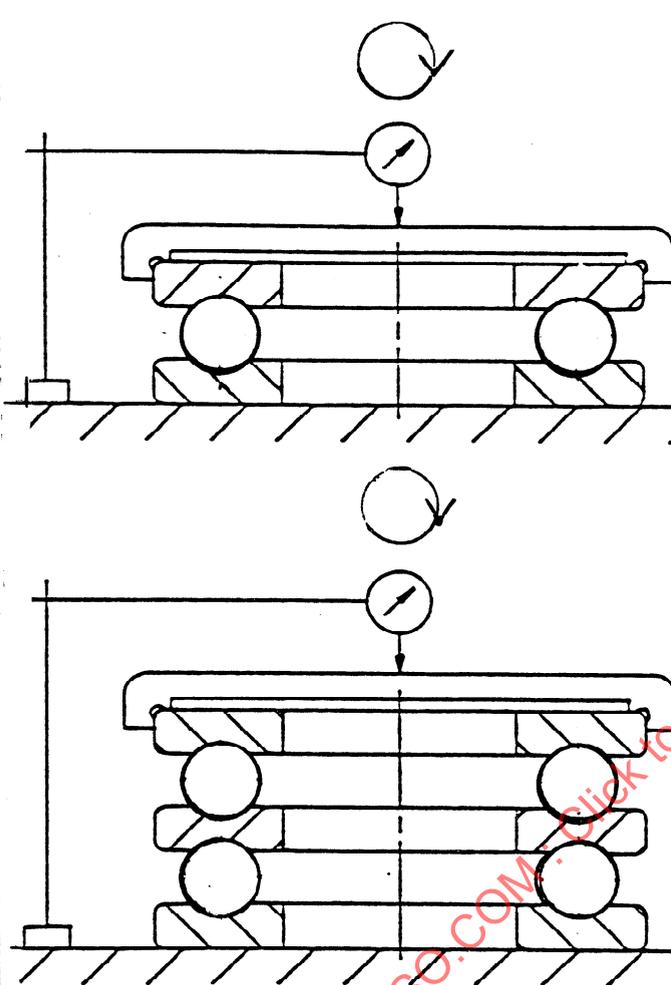| METHOD | COMMENTS |
|---|---|
| **7.8.1.2**<br><br><br><br>central washer of a<br>double direction<br>bearing<br><br>Support one of the flat faces on three equally spaced fixed axial supports of equal heights and provide suitable fixed radial supports in the bore as illustrated.<br><br>Position the indicator against the middle of the raceway opposite one fixed support and rotate the central washer one revolution. The thickness variation-$S_1$-is the difference between the largest and the smallest indicator readings.<br>Repeat the measurement on the opposite side. | |

7.8.1  Principle 1.  Two point measurement of thickness variation
between the back face and the raceway of housing washer.

| METHOD | COMMENTS |
|---|---|
| 7.8.1.3 <br><br>  <br><br> housing washer <br><br> Support the back face on three equally spaced fixed axial supports of equal heights and provide suitable fixed radial supports on the outside diameter as illustrated. <br><br> Position the indicator against the middle of the raceway opposite one fixed support and rotate the washer one revolution. The thickness variation-$S_e$-is the difference between the largest and the smallest indicator readings. | |

8        Assembled bearings.
8.1      Assembled bearing width or height – $T_s$, $T_{1s}$.
8.1.1    Principle 1.  Measurement of distance of assembled bearing width.

| METHOD | COMMENTS |
|---|---|
| 8.1.1.1 <br><br> Support the bearing on the cone back face and ensure the rollers are in contact with the cone back face rib and raceways. Place a plate of known dimensions on the cup back face and position an indicator over the centre of the plate and take an indicator reading. Parts shall be rotated before taking measurement, to be sure to reach the minimum width. Use a gauge block, with a size corresponding to the nominal size, for zero setting of the indicator. From these readings determine the assembled bearing width. | $\Delta_{Ts} = T_s - T$ <br><br> $\Delta_{Ts}$ = deviation of actual bearing width <br><br> $T$ = nominal bearing width |

8.1.1  Principle 1.  Measurement of distance of assembled bearing
        height.

| METHOD | COMMENTS |
|---|---|
| 8.1.1.2  | $\triangle_{Ts} = T_s - T$<br><br>$\triangle_{Ts}$ = deviation of actual bearing height<br><br>$T$ = nominal bearing height, single direction thrust bearing<br><br><br><br><br><br>$\triangle_{T1s} = T_{1s} - T$<br>$\triangle_{T1s}$ = deviation of actual bearing height<br><br>$T_1$ = nominal bearing height, double direction thrust bearing |
| Support the bearing on a surface plate. Place a plate of known dimensions on the bearing assembly as illustrated and position an indicator over the centre of the plate and take an indicator reading. Parts shall be rotated before taking measurement, to be sure to reach the minimum height. Use a gauge block, with a size corresponding to the nominal size, for zero setting of the indicator. From these readings determine the assembled bearing height. | |