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Rolling bearings — Geometrical product specifications (GPS) — Vocabulary and representation of symbols

Roulements — Spécification géométrique des produits (GPS) — Vocabulaire et représentation des symboles

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Foreword

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This document was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 4, *Rolling bearings - Vocabulary, boundary dimensions and geometrical product specifications.*

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document provides supportive references for associated rolling bearing International Standards that have been technically revised to introduce geometrical product specifications (GPS), especially ISO 199[3] and ISO 492[5]. This document replaces the role of ISO 1132-1[8] for terms and definitions in the field of rolling bearings.

This document keeps the existing symbols associated with rolling bearings because they are widely used in the market. The new terms for the symbols are as close as possible to the preceding long-standing traditional terms to facilitate the transition. In some cases, new terms are derived from the full GPS definition. The definitions of the established terms and symbols are necessarily changed according to the GPS rules.

Annex A shows the representation of geometrical product specifications in technical drawings and tables. Some examples are shown in Figures A.6 to A.16.

Rolling bearings — Geometrical product specifications (GPS) — Vocabulary and representation of symbols

1 Scope

This document defines common terms and symbols associated with geometrical product specifications (GPS) for use in the field of rolling bearings. This document gives requirements and recommendations on the transformation of GPS into figures and tables. This document includes the rules for the representation of symbols, tolerance values, limits of size, limit deviations and limit values for rolling bearings derived from GPS indications according to, for example, ISO 1101[7] and ISO 14405-1[13], including indications in textual documents and on technical drawings.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 Terms related to dimensional specifications

3.1.1 Nominal boundary dimensions

3.1.1.1
nominal inner ring width
B
distance between the two theoretical side faces of an inner ring

3.1.1.2
nominal outer ring width
C
distance between the two theoretical side faces of an outer ring

3.1.1.3
nominal outer ring flange width
C_1
distance between the two theoretical side faces of an outer ring flange

3.1.1.4
nominal outside diameter
D
<cylindrical outside surface> diameter of the cylinder containing the theoretical outside surface

3.1.1.5
nominal outside diameter of outer ring flange
D_1
diameter of the cylinder containing the theoretical outside surface of a flanged outer ring

3.1.1.6
nominal bore diameter
d
<cylindrical bore> diameter of the cylinder containing the theoretical bore surface

3.1.1.7
nominal bore diameter
d
<tapered bore> diameter, in a designated radial plane of the cone, containing the theoretical bore surface at the theoretical small end of an inner ring tapered bore

3.1.1.8
nominal bore diameter at the theoretical large end
d_1
<tapered bore> diameter, in a designated radial plane of the cone, containing the theoretical bore surface at the theoretical large end of an inner ring tapered bore

3.1.1.9
nominal bore diameter of central shaft washer
d_2
<cylindrical bore> diameter of the cylinder containing the theoretical bore surface of a central shaft washer

3.1.1.10
nominal assembled bearing height
T
<single-direction thrust bearing> distance between the two theoretical washer back faces of an *assembled bearing* (3.3.9)

3.1.1.11
nominal assembled bearing width
T
<tapered roller bearing> distance between the two theoretical back faces of an *assembled bearing* (3.3.9)

3.1.1.12
nominal assembled bearing height
T_1
<double-direction thrust bearing> distance between the two theoretical washer back faces of an *assembled bearing* (3.3.9)

3.1.1.13
nominal effective width of inner subunit with master outer ring
T_1
<tapered roller bearing> distance between the theoretical back face of an inner subunit and the theoretical reference face of a master outer ring

3.1.1.14
nominal effective width of outer ring with master inner subunit
T_2
<tapered roller bearing> distance between the theoretical back face of an outer ring and the theoretical reference face of a master inner subunit

3.1.1.15
nominal width of a flanged bearing
T_F
distance between the theoretical flange back face of an outer ring and the theoretical inner ring back face of an *assembled* flanged *bearing* (3.3.9)

3.1.1.16
nominal effective width of flanged outer ring with master inner subunit
T_{F2}
distance between the theoretical back face of a flanged outer ring and the theoretical reference face of a master inner subunit

3.1.1.17
nominal tapered slope
S_L
difference between the nominal bore diameter at the theoretical large end and the theoretical small end of an inner ring tapered bore

3.1.2 Bore diameter

3.1.2.1
range of mid-range bore diameter
V_{dmp}
range of sizes (3.3.6) derived from *mid-range sizes* (3.3.5) of bore diameters [out of *two-point size* (3.3.1) bore diameters] obtained in any cross-section of an inner ring cylindrical bore

Note 1 to entry: For more information about any cross-section, see ISO 14405-1:2016, 7.4[13].

3.1.2.2
range of bore diameter
V_{dsp}
range of sizes (3.3.6) derived from *two-point sizes* (3.3.1) of bore diameters in any cross-section of an inner ring or shaft washer cylindrical or tapered bore

Note 1 to entry: For more information about any cross-section, see ISO 14405-1:2016, 7.4[13].

3.1.2.3
range of central shaft washer bore diameter
V_{d2sp}
range of sizes (3.3.6) derived from *two-point sizes* (3.3.1) of bore diameters in any cross-section of a central shaft washer cylindrical bore of double-direction thrust bearing

Note 1 to entry: For more information about any cross-section, see ISO 14405-1:2016, 7.4[13].

3.1.2.4
deviation of bore diameter
Δ_{ds}
deviation (3.3.7) of a *two-point size* (3.3.1) bore diameter of an inner ring cylindrical bore

3.1.2.5
deviation of mid-range bore diameter
Δ_{dmp}
<cylindrical bore> *deviation* (3.3.7) of the *mid-range size* (3.3.5) bore diameter [out of *two-point size* (3.3.1) bore diameters] in any cross-section of an inner ring or shaft washer cylindrical bore

Note 1 to entry: For more information about any cross-section, see ISO 14405-1:2016, 7.4[13].

3.1.2.6
deviation of mid-range bore diameter
Δ_{dmp}
<tapered bore> *deviation* (3.3.7) of the *mid-range size* (3.3.5) bore diameter [out of *two-point size* (3.3.1) bore diameters] in a specific fixed cross-section at the theoretical small end of an inner ring tapered bore

Note 1 to entry: For more information about the specific fixed cross-section, see ISO 14405-1:2016, 7.5[13].

3.1.2.7
deviation of mid-range bore diameter at large end
Δ_{d1mp}
<tapered bore> *deviation* (3.3.7) of the *mid-range size* (3.3.5) bore diameter [out of *two-point size* (3.3.1) bore diameters] in a specific fixed cross-section at the theoretical large end of an inner ring tapered bore

Note 1 to entry: For more information about the specific fixed cross-section, see ISO 14405-1:2016, 7.5[13].

3.1.2.8
deviation of mid-range central shaft washer bore diameter
Δ_{d2mp}
deviation (3.3.7) of the *mid-range size* (3.3.5) bore diameter [out of *two-point size* (3.3.1) bore diameters] in any cross-section of a central shaft washer cylindrical bore

Note 1 to entry: For more information about any cross-section, see ISO 14405-1:2016, 7.4[13].

3.1.2.9
deviation of tapered slope
Δ_{SL}
deviation (3.3.7) of *tapered slope* (3.1.1.17) of an inner ring tapered bore

Note 1 to entry: Deviation for tapered slope fulfils Formula (1):

$$\Delta_{SL} = \Delta_{d1mp} - \Delta_{dmp} \quad (1)$$

3.1.3 Outside diameter

3.1.3.1
range of mid-range outside diameter
V_{Dmp}
range of sizes (3.3.6) derived from *mid-range sizes* (3.3.5) of outside diameters (out of *two-point size* (3.3.1) outside diameters) obtained in any cross-section of an outer ring cylindrical outside surface

Note 1 to entry: For more information about any cross-section, see ISO 14405-1:2016, 7.4[13].

3.1.3.2
range of outside diameter
V_{Dsp}
range of sizes (3.3.6) derived from *two-point sizes* (3.3.1) of outside diameters in any cross-section of an outer ring or housing washer cylindrical outside surface

Note 1 to entry: For more information about any cross-section, see ISO 14405-1:2016, 7.4[13].

3.1.3.3
deviation of outside diameter
Δ_{Ds}
deviation (3.3.7) of a *two-point size* (3.3.1) outside diameter of an outer ring cylindrical outside surface

3.1.3.4
deviation of outside diameter of outer ring flange
Δ_{D1s}
deviation (3.3.7) of a *two-point size* (3.3.1) outside diameter of an outer ring flange cylindrical outside surface

3.1.3.5
deviation of mid-range outside diameter
Δ_{Dmp}
deviation (3.3.7) of the *mid-range size* (3.3.5 outside diameter [out of *two-point size* (3.3.1) outside diameters] in any cross-section of an outer ring or housing washer cylindrical outside surface

Note 1 to entry: For more information about any cross-section, see ISO 14405-1:2016, 7.4[13].

3.1.4 Widths of inner and outer rings

3.1.4.1
range of inner ring width with faces offset or narrow
V_{Bgp}
range of sizes (3.3.6) derived from *minimum circumscribed sizes* (3.3.3) of inner ring widths, between two opposite lines, obtained in any longitudinal section which includes the inner ring bore axis

Note 1 to entry: This term applies particularly to rings having offset faces areas according to ISO 14405-1:2016, 7.4[13], the size (characteristic) is defined as the (local) minimum circumscribed size in any longitudinal section defined between two extracted integral lines (the intersection of the extracted integral feature of size and an intersection half plane including a datum, which in this case is the inner ring bore axis) in a direction parallel to this datum (to avoid instability when the extent of the opposite areas is small).

3.1.4.2
range of inner ring width with faces directly opposite
V_{Bs}
range of sizes (3.3.6) derived from *two-point sizes* (3.3.1) of inner ring widths

3.1.4.3
range of outer ring width with faces offset or narrow
V_{Cgp}
range of sizes (3.3.6) derived from *minimum circumscribed sizes* (3.3.3) of outer ring widths, between two opposite lines, obtained in any longitudinal section which includes the outer ring outside surface axis

Note 1 to entry: This term applies particularly to rings having offset faces areas according to ISO 14405-1:2016, 7.4[13], the size (characteristic) is defined as the (local) minimum circumscribed size in any longitudinal section defined between two extracted integral lines (the intersection of the extracted integral feature of size and an intersection half plane including a datum, which in this case is the outer ring outside surface axis) in a direction parallel to this datum (to avoid instability when the extent of the opposite areas is small).

3.1.4.4
range of outer ring width with faces directly opposite
V_{Cs}
range of sizes (3.3.6) derived from *two-point sizes* (3.3.1) of outer ring widths

3.1.4.5
range of outer ring flange width
V_{C1s}
range of sizes (3.3.6) derived from *two-point sizes* (3.3.1) of outer ring flange widths

3.1.4.6
deviation of inner ring width with faces offset or narrow
Δ_{Bgp}
deviation (3.3.7) of the *minimum circumscribed size* (3.3.3) inner ring width, between two opposite lines, in any longitudinal section which includes the inner ring bore axis

Note 1 to entry: This term applies particularly to rings having offset faces areas according to ISO 14405-1:2016, 7.4[13], the size (characteristic) is defined as the (local) minimum circumscribed size in any longitudinal section defined between two extracted integral lines (the intersection of the extracted integral feature of size and an intersection half plane including a datum, which in this case is the inner ring bore axis) in a direction parallel to this datum (to avoid instability when the extent of the opposite areas is small).

3.1.4.7
deviation of inner ring width with faces directly opposite
deviation of inner ring width with faces offset or narrow
Δ_{Bs}
deviation (3.3.7) of a *two-point size* (3.3.1) inner ring width

Note 1 to entry: This term is applied to upper and lower limit deviations for an inner ring width with faces directly opposite, and lower limit deviation for an inner ring width with faces offset or narrow.