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Rolling bearings and spherical plain bearings — Search structure for electronic media — Characteristics and performance criteria identified by property vocabulary

Roulements et rotules lisses — Structure de recherche pour supports électroniques — Caractéristiques et critères de performance identifiés par le vocabulaire des propriétés

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Contents

Page

Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 4, *Rolling bearings*.

This second edition cancels and replaces the first edition (ISO 21107:2004), which has been technically revised to be consistent with ISO/TS 23768-1.

Introduction

Electronic media are used more and more when purchasing and selling products. This also applies to the rolling bearing industry, where it can be expected that a large proportion of sales will be processed via electronic media.

One potential problem when ordering bearings is that designations, especially designations for special executions and variants, differ from one bearing supplier to another. For the electronic media business there is, therefore, a need for customers and distributors to have available a system that makes it possible to identify a bearing quickly and easily when the bearing designation is not known.

This can be achieved using a computerized search structure. The user responds to specified simple questions on a computer screen about visual bearing components (dimensions, number of rolling element rows, cage, etc.) and, if needed, about performance criteria and other characteristics. Based on these input values, the computer provides possible bearing designations and other information.

In order to facilitate programming and provide the user with the same and consistent input vocabulary, independent of supplier, this International Standard provides a standardized search structure for electronic media with a vocabulary for identifying bearings, bearing components and accessories based on ISO 5593 and other ISO/TC 4 International Standards.

When creating their own search structures, some bearing manufacturers and/or distributors may decide they have a need to customize certain properties or value domains in order to refine the selection of the possible bearing designation(s) that will meet the purchaser's requirements. If this is done, then, where possible, it is recommended that the terminology of ISO 5593 and other appropriate ISO documents for rolling bearings be used.

SI units are used in ISO International Standards, but it is recognized that the properties in this document can also be used for inch dimension products.

Rolling bearings and spherical plain bearings — Search structure for electronic media — Characteristics and performance criteria identified by property vocabulary

1 Scope

This International Standard establishes a search structure and properties vocabulary for identifying rolling bearings, bearing housings, accessories and spherical plain bearings primarily with the aid of electronic media, such as the Internet.

The methodology for using this International Standard in search programs is not included.

This International Standard does not establish a search structure and an attribute vocabulary for identifying linear motion rolling bearings.

NOTE A reference dictionary for all rolling bearings in this document is defined in ISO/TS 23768-1. It contains definitions of bearing classes, data element types of descriptive properties and domains of values.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the reference document (including any amendments) applies.

ISO 1132-1, *Rolling bearings — Tolerances — Part 1: Terms and definitions*

ISO 5593, *Rolling bearings — Vocabulary*

ISO 6811, *Spherical plain bearings — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions in ISO 1132-1, ISO 5593, ISO 6811 and the following apply.

3.1
non-leaf characterization class
characterization class that is further subdivided into more precise characterization classes

[SOURCE: ISO/TS 23768-1:2011, 3.1.24]

3.2
leaf characterization class
characterization class that is not further subdivided into more precise characterization classes

[SOURCE: ISO/TS 23768-1:2011, 3.1.22]

3.3
property
characteristic or feature used to identify a product in detail

Note 1 to entry: Product and component designations used in ISO/TC 4 International Standards have been used throughout this International Standard as the preferred choice.

3.4
value domain
set of permissible values

[SOURCE: ISO 22745-2:2010, 10.7]

4 Description and use of the search structure for electronic media

4.1 General

When Internet and other electronic media are used for ordering products, a system is needed to define a product easily and correctly, even when a product specification is not complete or is missing. This International Standard is built up to meet this requirement and makes it possible to identify dimensions, characteristics and demands on performance of rolling bearings, bearing housings and accessories with a standardized vocabulary.

Using the Internet, for instance, a purchaser can go to the "Home page" of a bearing manufacturer or a distributor and select a search program (individually established by each bearing manufacturer or distributor, but based on this International Standard). Then, by answering given questions (with specified alternative options), obtain a list of one or more product options with designations, availability, prices, etc.

The advantage of using a standardized search structure is that the purchaser always works with the same vocabulary, independent of manufacturer, and the risk of misunderstanding and confusion is reduced. As most properties of interest are included in the search structure, this makes programming considerably easier.

4.2 Layout of the search structure

The layout of the search criteria follows the general structure as used in the Internet environment, i.e. an XML (extensible mark-up language) specification for defining the data structure.

The data structure is built up in the way shown below and illustrated in Figure 1 and Table 1.

There are three levels of classification – non-leaf characterization class, leaf characterization class and property as defined in Clause 3.

Properties and **Value domains** to each class cover the information needed to define a product and are specified in 5.2 to 5.9 and 6.2. These properties and value domains are based on typical product ranges which can be found in manufacturers' catalogues and brochures.

Each user of this International Standard can select the applicable properties and value domains from this International Standard, and add further properties and value domains if needed. Additional value domains, either individually or as a group, can also be included under the value domain "Other". In general, the value domain "Other" is not shown in the tables, except for the properties "Tolerance" and "Clearance" with the only value domain "Normal".

It is possible to identify a product on the basis of class, properties and value domains.

For the user this is, however, not a problem when selection is made from the value domains presented in a search program. The supplier determines the product range value domains, and the programmer has to consider the logic in the value domains presented, so that combinations that are not possible are excluded during the selection process.

An example of how to use the search structure is shown in Annex A.

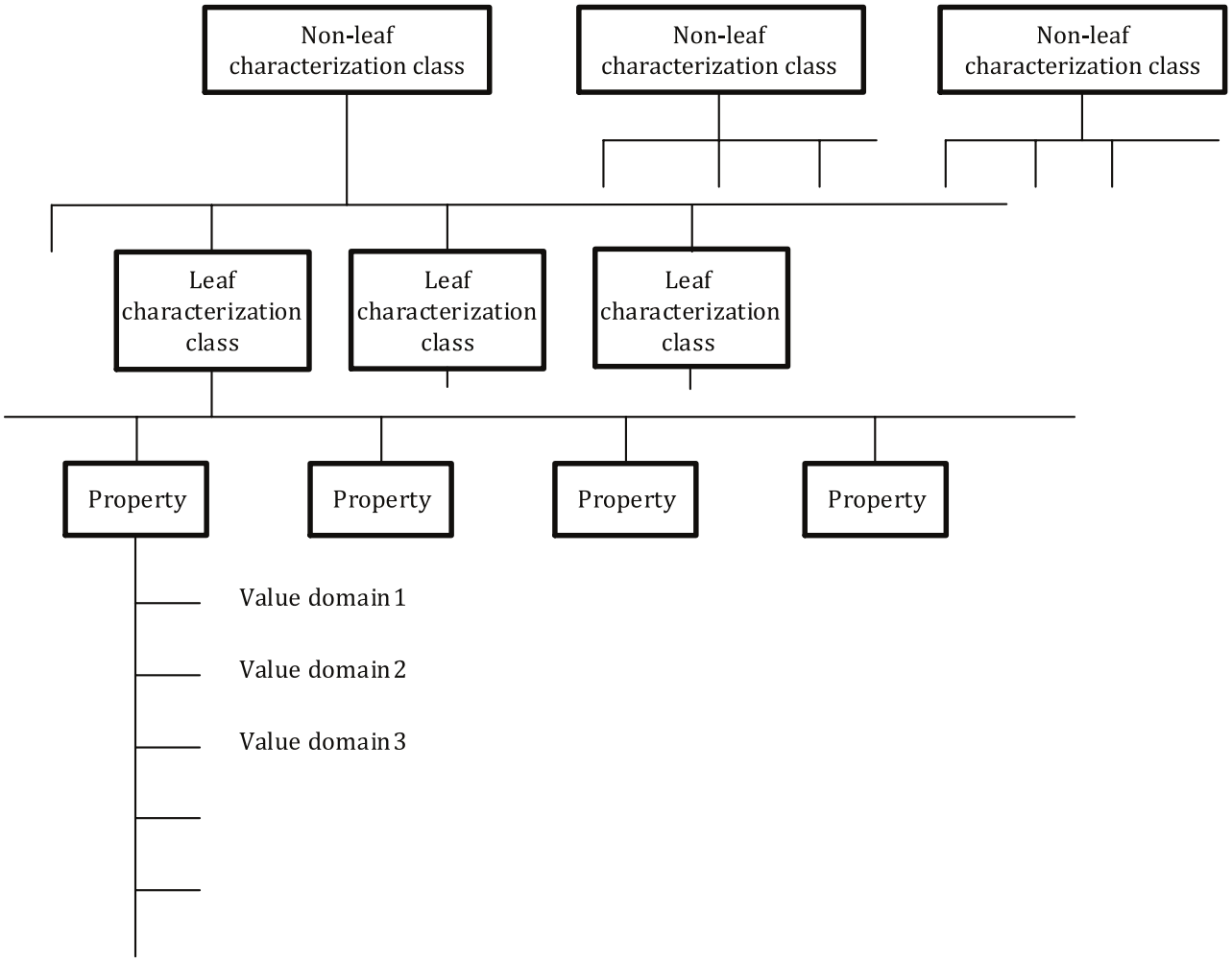

Figure 1 — Search structure

Table 1 — Description of the structure

Non-leaf characterization class	Leaf characterization class
Ball bearing	Deep groove ball bearings
	Angular contact radial ball bearing
	Angular contact thrust ball bearing
	Thrust ball bearing
	Self-aligning ball bearing
Roller bearing	Cylindrical roller bearing
	Thrust cylindrical roller bearing
	Needle roller bearing
	Thrust needle roller bearing
	Spherical roller bearing
	Thrust spherical roller bearing
	Tapered roller bearing
	Thrust tapered roller bearing
Insert bearing, unit, housing and accessory	Insert bearing
	Insert bearing unit
	Insert bearing housing
	Insert bearing accessory
Combined bearing	Combined bearing of radial needle roller/thrust ball type
	Combined bearing of radial needle roller/thrust roller type
Rolling bearing part	Ball
	Cylindrical roller
	Needle roller
	Thrust collar (L-shaped)
	Aligning seat washer
	Inner ring (special execution for needle roller bearing)
Bearing housing element	Bearing housing
	Accessory for bearing housing
	Bearing housing unit
Bearing accessory	Adapter sleeve
	Withdrawal sleeve
	Locknut and locking device
Track roller	Yoke-type track roller
	Stud-type track roller
	Accessory for track roller
Spherical plain bearing	Radial and angular contact radial spherical plain bearing
	Thrust spherical plain bearing
	Spherical plain bearing rod end

5 Properties and value domains for rolling bearings

5.1 General

The properties and value domains for leaf characterization classes of rolling bearings are given in Tables 2 to 33.

NOTE In the Tables 2 to 33, the **Properties** are shown in the row below the heading "Property and Value domain", and the **Value domains** are shown in the rows with option numbers. The order of the value domains does not have any specific meaning.

It is important to realize that the value domains shown in 5.2 to 5.9 illustrate possible options of each property. All value domains are, however, not always needed to cover the product range of a supplier. Besides, all value domains of one property can sometimes not logically be used. Taking an example from 5.3.1 *Cylindrical roller bearings*, a one row bearing with two outer ring ribs is selected. Then the value domain for selecting "Inner ring with two ribs" is to be excluded, as such a bearing is not a bearing type in regular production.

5.2 Ball bearings

5.2.1 Deep groove ball bearings

Table 2 — Properties and value domains for deep groove ball bearings

Property	Value domain					
	1	2	3	4	5	6
Number of rows	Value					
Bore type	Cylindrical	Tapered				
Cage	Sheet metal	Non-metallic	Machined metal	Without		
Filling slot	Without	With				
Relubrication feature	Without	With				
Sealing	Without	Seal on both sides	Shield on both sides	Seal on one side	Shield on one side	Seal on one side, shield on the other
Sealing type	Contact	Non-contact				
Lubricant	None	Grease	Solid oil	Solid lubricant		
Locating feature, bearing outer ring	None	Snap ring groove	Snap ring (fitted)	Retaining slot	Flange	
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Width	Value/Range					
Matched arrangement	No	Face-to-face (X)	Back-to-back (O)	Tandem (T)		
Radial internal clearance	Group N (CN)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)	Group 5 (C5)	
Material, bearing	Bearing steel	Stainless steel	Ceramic	Hybrid	High temperature steel	
Coating	Without	Coated	Insulated			
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	Class 4 (P4)	Class 2 (P2)	

5.2.2 Angular contact radial ball bearings

Table 3 — Properties and value domains for angular contact radial ball bearings

Property	Value domain					
	1	2	3	4	5	6
Contact type	Normal contact (two-point contact)	Four-point contact	Three-point contact			
Number of rows	Value					
Arrangement of contact angle (double-row bearing)	Back-to-back (O)	Face-to-face (X)				
Ring type	One-piece inner and outer rings	Two-piece inner ring and one piece outer ring	Two-piece outer ring and one piece inner ring			
Cage	Non-metallic	Sheet metal	Machined metal	Without		
Sealing	Without	Seal on both sides	Shield on both sides	Seal on one side	Shield on one side	Seal on one side, shield on the other
Sealing type	Contact	Non-contact				
Relubrication feature	Without	With				
Lubricant	None	Grease	Solid oil	Solid lubricant		
Locating feature, bearing outer ring	None	Snap ring groove	Snap ring (fitted)	Retaining slot	Flange	
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Width	Value/Range					
Contact angle	Value/Range					
Axial internal clearance	Group N (CN)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)	Group 5 (C5)	
Radial internal clearance	Group N (CN)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)	Group 5 (C5)	
Matched arrangement	No	Face-to-face (X)	Back-to-back (O)	Tandem (T)	Combination of back-to-back (O) and tandem (T)	Combination of face-to-face (X) and tandem (T)
Universal matching bearing	No	Yes				
Number of bearing in matched set	Value					
Matched condition (axial clearance/ preload)	Small clearance	Medium clearance	Large clearance	Light preload	Medium preload	Heavy preload
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	Class 4 (P4)	Class 2 (P2)	
Coating	Without	Coated	Insulated			
Material, bearing	Bearing steel	Stainless steel	Ceramic	Hybrid	High temperature steel	

5.2.3 Angular contact thrust ball bearings

Table 4 — Properties and value domains for angular contact thrust ball bearings

Property	Value domain					
	1	2	3	4	5	6
Number of rows	Value					
Housing washer type (double-row angular contact thrust ball bearings)	One-piece	Two-piece				
Cage	Sheet metal	Non metallic	Machined metal	Without		
Sealing	Without	Seal on both sides	Shield on both sides	Seal on one side	Shield on one side	Seal on one side, shield on the other
Sealing type	Contact	Non-contact				
Axial load capability	Single-direction	Double-direction				
Relubrication feature	Without	With				
Lubricant	None	Grease	Solid oil			
Locating feature, bearing outer ring	None	Snap ring groove	Snap ring (fitted)	Retaining slot	Flange	
Bore diameter	Value/ Range					
Outside diameter	Value/ Range					
Height	Value/ Range					
Coating	Without	Coated	Insulated			
Matched arrangement	No	Face-to-face (X)	Back-to-back (O)	Tandem (T)	Combination of back-to-back (O) and tandem (T)	Combination of face-to-face (X) and tandem (T)
Number of bearing in matched set	Value					
Matched condition (axial clearance/preload)	Small clearance	Medium clearance	Large clearance	Light preload	Medium preload	Heavy preload
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	Class 4 (P4)	Class 2 (P2)	
Contact angle	Value/ Range					
Material, bearing	Bearing steel	Stainless steel	Ceramic	Hybrid	High temperature steel	
Single bearing, universally matchable (delivered individually)	Yes	No				
Preload single bearing (double-row angular contact thrust ball bearing)	Light	Medium	Heavy			

5.2.4 Thrust ball bearings

Table 5 — Properties and value domains for thrust ball bearings

Property	Value domain				
	1	2	3	4	5
Housing washer type	Flat back face	Spherical back face			
Number of rows	Value				
Axial load capability[a]	Single-direction	Double-direction			
Cage	Sheet metal	Non metallic	Machined metal		
Coating	Without	Coated	Insulated		
Bore diameter	Value/Range				
Outside diameter	Value/Range				
Height	Value/Range				
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	Class 4 (P4)	
Material, bearing	Bearing steel	Stainless steel	Ceramic	Hybrid	High temperature steel
Radius of aligning surface[a]	Value/Range				

[a] This property is not considered in ISO/TS 23768-1:2011.

5.2.5 Self-aligning ball bearings

Table 6 — Properties and value domains for self-aligning ball bearings

Property	Value domain				
	1	2	3	4	5
Bore type	Cylindrical	Tapered			
Cage	Sheet metal	Non metallic	Machined metal		
Sealing	Without	Seal on both side	Shield on both sides	Seal on one side	Shield on one side
Sealing type	Contact	Non-contact			
Relubrication feature	Without	With			
Lubricant	None	Grease	Solid oil		
Locating feature, bearing outer ring	None	Snap ring groove	Snap ring (fitted)	Retaining slot	
Bore diameter	Value/Range				
Outside diameter	Value/Range				
Width	Value/Range				
Radial internal clearance	Group N(CN)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)	Group 5 (C5)
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	Class 4 (P4)	Class 2 (P2)
Material, bearing	Bearing steel	Stainless steel	High temperature steel	Hybrid	Ceramic
Coating	Without	Coated	Insulated		

5.3 Roller bearings

5.3.1 Cylindrical roller bearings

Table 7 — Properties and value domains for cylindrical roller bearings

Property	Value domain					
	1	2	3	4	5	6
Number of rows	Value					
Bearing part	Complete bearing	Bearing without inner ring	Bearing without outer ring	Inner ring	Roller and cage assembly	Outer ring
Number of ribs, outer ring	None	One	Two	Three		
Number of ribs, inner ring	None	One	Two	Three		
Loose rib	None	Inner ring loose rib (flat washer)	Outer ring loose rib (flat washer)	Thrust collar (L-shaped)		
Bore type	Cylindrical	Tapered				
Cage	Sheet metal	Non metallic	Machined metal	Without		
Locating feature, bearing outer ring	None	Snap ring groove	Snap ring (fitted)	Retaining slot	Flange	
Relubrication feature	Without	With				
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Width	Value/Range					
Radial internal clearance	Group N (CN)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)	Group 5 (C5)	
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	Class 4 (P4)	Class 2 (P2)	
Lubricant	None	Grease	Solid oil			
Coating	Without	Coated	Insulated			
Sealing	without	Seal on both sides	Shield on both sides	Seal on one side	Shield on one side	Seal on one side, shield on the other
Sealing type	Contact	Non-contact				
Material, bearing	Bearing steel	Case carburised steel	Stainless steel	High temperature steel	Hybrid	Ceramic

5.3.2 Thrust cylindrical roller bearings

Table 8 — Properties and value domains for thrust cylindrical roller bearings

Property	Value domain					
	1	2	3	4	5	6
Bearing part	Complete bearing	Roller and cage assembly	Shaft washer	Housing washer	Central shaft washer	
Cage	Non-metallic	Machined metal				
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Height	Value/Range					
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	Class 4 (P4)		
Axial load capability	Single-direction	Double-direction				
Number of rows	Value					
Coating	Without	Coated	Insulated			
Material, bearing	Bearing steel	Case carburised steel	Stainless steel	High temperature steel	Hybrid	Ceramic

5.3.3 Needle roller bearings

Table 9 — Properties and value domains for needle roller bearings

Property	Value domain				
	1	2	3	4	5
Outer ring type	Machined (solid)	Drawn cup with open ends	Drawn cup with one closed end		
Bearing part	Complete bearing	Bearing without inner ring	Needle roller and cage assembly	Inner ring	
Cage	Sheet metal	Non metallic	Machined metal	Without	
Sealing	Without	Seal on both sides	Seal on one side		
Sealing type	Contact	Non-contact			
Radial internal clearance	Group N (CN)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)	Group 5 (C5)
Bore diameter	Value/Range				
Bore diameter of needle roller complement[a]	Value/Range				
Outside diameter	Value/Range				
Outside diameter of needle roller complement[a]	Value/Range				
Width	Value/Range				
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	Class 4 (P4)	
Relubrication feature	With	Without			
Lubricant	None	Grease	Solid oil		
Number of ribs, outer ring	Two	Three	None		
Number of rows	Value				
Aligning feature	Without	With			
Coating	Without	Coated			
Material, bearing	Bearing steel	Stainless steel	Case carburised steel		

[a] This property is not considered in ISO/TS 23768-1:2011.

5.3.4 Thrust needle roller bearings

Table 10 — Properties and value domains for thrust needle roller bearings

Property	Value domain					
	1	2	3	4	5	6
Bearing part	Roller and cage assembly	Thrust washer	Shaft washer	Housing washer	Needle roller and cage assembly with washer having centring feature	Complete bearing
Cage	Sheet metal	Non-metallic	Machined metal			
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Height	Value/Range					
Needle roller grade	G2	G3	G5			
Coating	Without	Coated	Insulated			
Material, bearing	Bearing steel	Stainless steel	High temperature steel	Hybrid	Ceramic	

5.3.5 Spherical roller bearings

Table 11 — Properties and value domains for spherical roller bearings

Property	Value domain					
	1	2	3	4	5	6
Number of rows	Value					
Bore type	Cylindrical	Tapered 1:12	Tapered 1:30			
Cage	Sheet metal	Machined metal	Non-metallic			
Relubrication feature	With	Without				
Locating feature, bearing outer ring	Without	Snap ring groove	Snap ring (fitted)	Retaining slot		
Sealing	Without	Seal on both sides	Shield on both sides	Seal on one side	Shield on one side	Seal on one side, shield on the other
Sealing type	Contact	Non-contact				
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Width	Value/Range					
Coating	Without	Coated	Insulated			
Lubricant	None	Grease	Solid oil			
Radial internal clearance	Group N (CN)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)	Group 5 (C5)	
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	Class 4 (P4)		
Material, bearing	Bearing steel	Case carburised steel	Stainless steel	High temperature steel	Hybrid	Ceramic

5.3.6 Thrust spherical roller bearings

Table 12 — Properties and value domains for thrust spherical roller bearings

Property	Value domain					
	1	2	3	4	5	6
Cage	Machined metal	Sheet metal	Non-metallic			
Locating feature, housing washer	None	Retaining slot				
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Height	Value/Range					
Coating	Without	Coated	Insulated			
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)			
Material, bearing	Bearing steel	Case carburised steel	Stainless steel	High temperature steel	Hybrid	Ceramic

5.3.7 Tapered roller bearings

Table 13 — Properties and value domains for tapered roller bearings

Property	Value domain							
	1	2	3	4	5	6	7	8
Number of rows	Value							
Cage	Sheet metal	Non metallic	Machined metal	Without				
Arrangement of contact angle (double-row bearing)	Face-to-face (X)	Back-to-back (O)						
Bearing design[a]	None	R	DZ	DZU	D	DU	DB	DBU
Bearing part	Complete bearing	Inner ring, cage and roller assembly (cone assembly)	Outer ring (cup)					
Bore type	Cylindrical	Tapered						
Single-row bearing for matching, pre-adjusted	Yes	No						
Contact angle	Value/ Range							
Locating feature, bearing outer ring	None	Flange	Snap ring (fitted)	Retaining slot				

[a] The symbols of the bearing design are described in ISO 10317:2008 and ISO 10317:2008/Amd 1.

[b] This property is not considered in ISO/TS 23768-1:2011.

[c] Only applicable for double-row bearing and matched bearing.

Table 13 *(continued)*

Property	Value domain							
	1	2	3	4	5	6	7	8
Relubrication feature	With	Without						
Bore diameter	Value/ Range							
Outside diameter	Value/ Range							
Width, total	Value/ Range							
Width, inner ring	Value/ Range							
Width, outer ring	Value/ Range							
Tolerance class	Normal	Class 6X (P6X)	Class 5 (P5)	Class 4 (P4)	Class 2 (P2)			
Lubricant	None	Grease	Solid oil					
Sealing	Without	Seal on both sides	Shield on both sides	Seal on one side	Shield on one side	Seal on one side, shield on the other		
Sealing type	Contact	Non-contact						
Material, bearing	Bearing steel	Case carburised steel	Stainless steel	High temperature steel	Hybrid	Ceramic		
Matched arrangement	No	Face-to-face (X)	Back-to-back (O)	Tandem (T)	Combination of back-to-back (O) and tandem (T)	Combination of face-to-face (X) and tandem (T)		
Number of matched bearings	Value							
Coating[b]	Without	Coated	Insulated					
Internal clearance [c]	Group N (CN)	Group 1 (C1)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)	Group 5 (C5)		

[a] The symbols of the bearing design are described in ISO 10317:2008 and ISO 10317:2008/Amd 1.

[b] This property is not considered in ISO/TS 23768-1:2011.

[c] Only applicable for double-row bearing and matched bearing.

5.3.8 Thrust tapered roller bearings

Table 14 — Properties and value domains for thrust tapered roller bearings

Property	Value domain					
	1	2	3	4	5	6
Bearing part	Complete bearing	Housing washer	Shaft washer	Roller and cage assembly		
Number of rows	Value					
Axial load capability	Single-direction	Double-direction				
Cage	Sheet metal	Non metallic	Machined metal	Without		
Sealing	Without	With cap	With contact seal	With cap and contact seal		
Lubricant	None	Grease				
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Height	Value/Range					
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)			
Coating	Without	Coated	Insulated			
Material, bearing	Bearing steel	Case carburised steel	Stainless steel	High temperature steel	Hybrid	Ceramic

5.4 Insert bearings

5.4.1 Insert bearings (bearing only)

Table 15 — Properties and value domains for insert bearings (bearing only)

Property	Value domain					
	1	2	3	4	5	6
Bore type	Cylindrical	Tapered	Square	Hexagonal		
Outside diameter type	Spherical	Cylindrical				
Rubber collar	Without	With				
Cage	Non-metallic	Sheet metal	Machined metal			
Retaining feature, inner ring	Eccentric locking collar	Grub screw locking	Concentric locking collar	Adapter sleeve	Slot in inner ring	None
Coating	Without	Coated				
Relubrication feature	With	Without				
Lubricant	Grease	Solid oil				
Sealing	Seal on both sides	Shield on both sides	Seal and flinger on both sides	Seal on one side, shield on the other	Shield and flinger on both sides	
Sealing type	Contact	Non-contact				
Material, bearing	Bearing steel	Stainless steel	High temperature steel			
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Width, inner ring	Value/Range					
Width, outer ring	Value/Range					
Rolling elements	Balls	Convex rollers				

5.4.2 Insert bearing units

Table 16 — Properties and value domains for insert bearing units

Property	Value domain					
	1	2	3	4	5	6
Housing type	Plummer block (pillow block)	Flanged	Take-up housing	Cartridge housing	Flanged housings with spigot joint	
Material, housing	Cast iron	Sheet metal	Spheroidal graphite cast iron	Composite	Cast steel	Stainless steel
Flanged housing type	Square	Oval	Round	Triangular		
Bore type	Cylindrical	Tapered	Square	Hexagonal		

Table 16 *(continued)*

Property	Value domain					
	1	2	3	4	5	6
Retaining feature, inner ring	Eccentric locking collar	Grub screw locking	Concentric locking collar	Adapter sleeve	Slot in inner ring	None
Sealing, bearing	Seal on both sides	Shield on both sides	Seal and flinger on both sides	Seal on one side, shield on the other	Shield and flinger on both sides	
Sealing type	Contact	Non-contact				
Lubricant	Grease	Solid oil				
Relubrication hole	With	Without				
Relubrication nipple	With	Without				
Material, bearing	Bearing steel	Stainless steel	High temperature steel			
Shaft diameter	Value/Range					
Fastening bolt hole type	Plain holes	Threaded holes				
Number of bolt holes for fasteners	Value					
Pitch diameter of bolt holes of round and triangle flange type housing	Value/Range					
Coating	Without	Bearing coated	Housing coated	Bearing and housing coated		
Centre distance of bolt holes of pillow type, square and oval flange type housing	Value/Range					
Centre height of pillow type or plummer block housing	Value/Range					
Housing overall width	Value/Range					
Bearing width, total	Value/Range					
Sealing, unit	Without	Cover with rubber seal on both sides	Cover with rubber seal on one side	End cap on one side	End cap on one side and cover with rubber seal on the other side	

5.4.3 Insert bearing housings

Table 17 — Properties and value domains for insert bearing housings

Property	Value domain					
	1	2	3	4	5	6
Housing type	Plummer block (pillow block)	Flanged	Take-up housing	cartridge housing	Flanged housings with spigot joint	
Material, housing	Cast iron	Sheet metal	Spheroidal graphite cast iron	Composite	Cast steel	Stainless steel
Flanged housing type	Square	Oval	Round	Triangular		
Relubrication hole	With	Without				
Relubrication nipple	With	Without				
Fastening bolt hole type	Plain	Threaded				
Spherical seating diameter	Value/Range					
Number of bolt holes for fasteners	Value					
Pitch diameter of bolt holes of round and triangle flange type housing	Value/Range					
Centre distance of bolt holes of pillow type, square and oval flange type housing	Value/Range					
Centre height of pillow type or plummer block housing	Value/Range					
Overall width, total	Value/Range					

5.4.4 Insert bearing accessories

Table 18 — Properties and value domains for insert bearing accessories

Property	Value domain			
	1	2	3	4
Accessory type	End cap			
Insert bearing accessory material	Composite	Sheet metal	Cast iron	Rubber
Bore diameter	Value/Range			
Outside locating diameter	Value/Range			
Width	Value/Range			
Pitch diameter of bolt holes	Value/Range			
Number of bolt holes	Value			

5.5 Combined bearings

Table 19 — Properties and value domains for combined bearings of radial needle roller/thrust ball type or radial needle roller/thrust roller type

Property	Value domain		
	1	2	3
Rolling element (thrust part)	Balls	Rollers	
Axial load capability	Single-direction	Double-direction	
Rolling bearing type	Complete bearing	Radial part without inner ring	
Thrust part	With cage	Without cage	
Radial internal clearance	Group N (CN)	Other	
Bore diameter	Value/Range		
Outside diameter	Value/Range		
Width	Value/Range		
Tolerance class	Normal	Other	
Coating	Without	Coated	
Material, bearing	Bearing steel	Stainless steel	
Lubricant (thrust part)	None	Grease	
Special feature	Thrust part with retaining cap	Flanged outer ring with holes	Flanged outer ring without holes
Radial part	With cage	Without cage	

5.6 Rolling bearing parts

5.6.1 Balls

Table 20 — Properties and value domains for balls

Property	Value domain										
	1	2	3	4	5	6	7	8	9	10	11
Material	Bearing steel	Stainless steel	Ceramic								
Diameter	Value/ Range										
Ball grade	G3	G5	G10	G16	G20	G24	G28	G40	G60	G100	G200
Coating	Coated	Without									

5.6.2 Cylindrical rollers

Table 21 — Properties and value domains for cylindrical rollers

Property	Value domain					
	1	2	3	4	5	6
Material	Bearing steel	Stainless steel	Ceramic			
Diameter	Value/Range					
Length	Value/Range					
Cylindrical roller grade[a]	G1	G1A	G2	G2A	G3	G5
Coating	Without	Coated	Insulated			

[a] This property is not considered in ISO/TS 23768-1:2011.

5.6.3 Needle rollers

Table 22 — Properties and value domains for needle rollers

Property	Value domain		
	1	2	3
Material	Bearing steel	Stainless steel	
Needle roller end type	Flat ends	Rounded ends	
Diameter	Value/Range		
Length	Value/Range		
Needle roller grade	G2	G3	G5
Coating	Without	Coated	Insulated

5.6.4 Thrust collars (L-shaped)

Table 23 — Properties and value domains for thrust collars (L-shaped)

Property	Value domain	
	1	2
For use with bearing	"Bearing designation"	
Bore diameter	Value/Range	
Outside diameter	Value/Range	
Width in bore	Value/Range	
Width on outside diameter[a]	Value/Range	
Material	Bearing steel	Stainless steel
Coating	Without	Coated
[a] This property is not considered in ISO/TS 23768-1:2011.		

5.6.5 Aligning seat washers for thrust ball bearings

Table 24 — Properties and value domains for aligning seat washers for thrust ball bearings

Property	Value domain	
	1	2
For use with bearing	"Bearing designation"	
Outside diameter	Value/Range	
Bore diameter	Value/Range	
Height	Value/Range	
Material	Bearing steel	Stainless steel
Coating	Without	Coated
Centre height of aligning seat[a]	Value	
[a] See ISO 20516.		

5.6.6 Inner rings for needle roller bearings

Table 25 — Properties and value domains for inner rings for needle roller bearings

Property	Value domain			
	1	2	3	4
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	
Radial internal clearance (in assembled bearing)	Group N (CN)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)
Relubrication feature	Without	With		
Bore diameter	Value/Range			
Outside diameter	Value/Range			
Width, inner ring	Value/Range			
Material	Bearing steel	Stainless steel		
Coating	Without	Coated		
Special raceway feature	None	Without lead chamfer	For use with seals	With allowance for finish grinding

5.7 Bearing housings and housing accessories

5.7.1 Bearing housings

Table 26 — Properties and value domains for bearing housings

Property	Value domain			
	1	2	3	4
Housing type	Plummer block (pillow block)	Take-up housing	Flanged	
Housing configuration	One-piece	Two-piece		
Mounting arrangement	Through shaft	Shaft end		
Bearing configuration	Adapter sleeve	Cylindrical bore		
Seating diameter	Value/Range			
Centre height (plummer block)	Value/Range			
Fastening bolt hole type	Cast holes	Drilled holes	Without holes	
Number of bolt holes for fasteners	Value			
Pitch diameter of bolt holes	Value/Range			
Centre distance between bolt holes	Value/Range			
Bearing housing seal type	Felt seal	Lip seal	V-ring seal	Labyrinth seal
Material, housing	Cast iron	Spheroidal graphite cast iron	Cast steel	

5.7.2 Accessories for bearing housings

Table 27 — Properties and value domains for accessories for bearing housings

Property	Value domain	
	1	2
Housing designation	"Housing designation"	
Accessory type	End cover	Locating ring
Outside diameter	Value/Range	
Width	Value/Range	

5.7.3 Bearing housing units

Table 28 — Properties and value domains for bearing housing units

Property	Value domain				
	1	2	3	4	5
Housing type	Plummer block (pillow block)	Take-up housing	Flanged		
Housing configuration	One-piece	Two-piece			
Bearing insert	Spherical roller bearing	Self-aligning ball bearing	Cylindrical roller bearing	Angular contact ball bearing	Deep groove ball bearing
Mounting arrangement	Through shaft	Shaft end			
Bearing configuration	Adapter sleeve	Without adapter sleeve			
Bore diameter (bearing)	Value/Range				
Centre height (plummer block)	Value/Range				
Fastening bolt hole type	Cast holes	Drilled holes	Without holes		
Number of bolt holes for fastener	Value				
Pitch diameter of bolt holes	Value/Range				
Centre distance between bolt holes	Value/Range				
Bearing housing seal type	Felt seal	Lip seal	V-ring seal	Labyrinth seal	
Material, housing	Cast iron	Spheroidal graphite cast iron	Cast steel		
End cover	With	Without			
Locating ring	With	Without			

5.8 Bearing accessories

5.8.1 Adapter and withdrawal sleeve

Table 29 — Properties and value domains for adapter and withdrawal sleeve

Property	Value domain	
	1	2
Sleeve type	Adapter sleeve	Withdrawal sleeve
Holes for oil injection	With	Without
Bore diameter	Value/Range	
Thread designation	Value/Range	
Width	Value/Range	
Taper [a]	1:12	1:30

[a] This property is not considered in ISO/TS 23768-1:2011.

5.8.2 Locknuts and locking devices

Table 30 — Properties and value domains for locknuts and locking devices

Property	Value domain			
	1	2	3	4
For use with sleeve	"Tapered sleeve designation"			
Locking device	Lockwasher	Locking clip	Incorporated in the locknut	None
Thread designation	Value/Range			
Outside diameter	Value/Range			
Width	Value/Range			
Nut for hydraulic mounting	Yes	No		

5.9 Track rollers

5.9.1 Yoke-type track rollers

Table 31 — Properties and value domains for yoke-type track rollers

Property	Value domain			
	1	2	3	4
Application	Support roller	Lift mast roller	Chain guide roller	Back-up roller
Outer ring profile	Crowned	Cylindrical	U-profile	V-profile
Rolling elements	Needle rollers	Cylindrical rollers	Balls	
Number of rows	Value			
Bearing part	Complete track roller	Track roller without inner ring		
Cage	With	Without		
Sealing	Contact seals	Shield	Without	
Number of flanges on outer ring	None	Two	One	
Axial guidance of outer ring	Yes	No		
Lubricant	Grease	None		
Relubrication feature	With	Without		
Bore diameter	Value/Range			
Functional outside diameter	Value/Range			
Width, outer ring	Value/Range			
Width, total	Value/Range			
Radial internal clearance	Group N (CN)	Group 2 (C2)	Group 3 (C3)	Group 4 (C4)
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	
Material, bearing	Bearing steel	Stainless steel		
Coating	Without	Coated		

5.9.2 Stud-type track rollers

Table 32 — Properties and value domains for stud-type track rollers

Property	Value domain			
	1	2	3	4
Outer ring profile	Crowned	Cylindrical	U-profile	V-profile
Rolling elements	Needle rollers	Cylindrical rollers	Balls	
Number of rows	Value			
Cage	With	Without		
Stud alignment	Centric	Eccentric	Concentric stud with eccentric collar	
Feature for tightening	Screw driver slot	Hexagon socket		
Sealing	Contact seals	Shield	Without	
Number of flanges on outer ring	None	Two	One	
Lubricant	Grease	None		
Relubrication feature	Centre of stud at the ribbed end	Centre of stud at the ribbed and threaded ends	Radial hole in stud shank	
Functional outside diameter	Value/Range			
Stud diameter	Value/Range			
Width, outer ring	Value/Range			
Length, total[a]	Value/Range			
Radial internal clearance	Group N (CN)	Group 2 (C2)		
Tolerance class	Normal	Class 6 (P6)	Class 5 (P5)	
Material, bearing	Bearing steel	Stainless steel		
Coating	Without	Coated		

[a] This property is not considered in ISO/TS 23768-1:2011.

5.9.3 Accessories for track rollers

Table 33 — Properties and value domains for accessories for track rollers

Property	Value domain			
	1	2	3	4
For use with track roller	"Track roller designation"			
Accessory type	Locknut	Lubrication nipple	Lubrication adapter	Closing plug

6 Properties and value domains for spherical plain bearings

6.1 General

The properties and value domains for leaf characterization classes of spherical plain bearings are given in Tables 34 to 36.

NOTE In Tables 34 to 36, the **Properties** are shown in the row below the heading "Property and Value domain", and the **Value domains** are shown in the rows with option numbers. The order of the value domains does not have any specific meaning.

It is important to realize that the value domains shown in 6.2 illustrate possible options of each property. All value domains are, however, not always needed to cover the product range of a supplier. Besides, all value domains of one property can sometimes not logically be used.

6.2 Spherical plain bearings

6.2.1 Radial and angular contact radial spherical plain bearings

Table 34 — Properties and value domains for radial and angular contact radial spherical plain bearing

Property	Value domain							
	1	2	3	4	5	6	7	8
Type	Radial	Angular contact						
Sealing	None	Seal on both sides						
Sliding material, contacting surfaces	Steel/ Steel	Steel/ Bronze	Steel/ Composite	Steel/PTFE	Hard chromium/ Bronze	Hard chromium/ PTFE	Hard chromium/ Composite	Other
Relubrication feature	With	Without						
Lubricant (in bearing)	None	Grease	MoS2					
Bore diameter	Value/ Range							
Outside diameter	Value/ Range							
Width, inner ring	Value/ Range							
Width, outer ring	Value/ Range							
Radial internal clearance	Group N (CN)	Group 2 (C2)	Group 3 (C3)					
Material	Bearing steel	Stainless steel						
Coating	Chromium plated	Phosphate coated	MoS_2 coated					

6.2.2 Thrust spherical plain bearings

Table 35 — Properties and value domains for thrust spherical plain bearings

Property	Value domain					
	1	2	3	4	5	6
Load direction	Combined axial and radial	Axial only				
Sliding material, contacting surfaces	Steel/Steel	Steel/Composite	Steel/Bronze	Steel/PTFE	Hard chromium/ PTFE	Hard chromium/ Composite
Relubrication feature	With	Without				
Lubricant (in bearing)	None	Grease	MoS_2			
Bore diameter	Value/Range					
Outside diameter	Value/Range					
Height, total	Value/Range					
Height, shaft washer	Value/Range					
Height, housing washer	Value/Range					
Material	Bearing steel	Stainless steel				
Coating	Chromium plated	Phosphate coated	MoS_2 coated			

6.2.3 Spherical plain bearing rod ends

Table 36 — Properties and value domains for spherical plain bearing rod ends

Property	Value domain							
	1	2	3	4	5	6	7	8
Type	Rod end with stud	Rod end with ball stud	Rod end without stud					
Outer ring integrated	No (cartridge design)	Yes (integral design)						
Sliding material, contacting surfaces	Steel/Steel	Steel/ Bronze	Steel/ Composite	Steel/ PTFE	Hard chromium/ Bronze	Hard chromium/ PTFE	Hard chromium/ Composite	Steel/ Casting zinc alloy
Attachment feature, rod end shank	Internal thread, right hand	Internal thread, left hand	External thread, right hand	External thread, left hand	Internal thread and clamping screws	Circular face, with locating pin, for welding	Rectangular face for welding	
Sealing	None	Seal on both sides	Dust cover on both sides					
Relubrication feature	with	without						
Lubricant (in bearing)	None	Grease	MoS_2					
Bore diameter, bearing inner ring	Value/ Range							
Width, bearing inner ring	Value/ Range							
Radial internal clearance	Group N (CN)	Group 2 (C2)	Group 3 (C3)					
Outside diameter, housing eye	Value/ Range							
Width, housing eye	Value/ Range							
Centre height, housing (from end of shank)	Value/ Range							
Housing length, total	Value/ Range							
Attachment thread diameter, rod end shank	Value/ Range							
Material, housing	Cast iron	Steel	Composite	Die cast aluminium	Casting zinc alloy			
Material, bearing	Bearing steel	Stainless steel						
Coating	Without	Bearing coated	Housing coated	Bearing and housing coated				
Thread designation	Value/ Range							

Annex A
(informative)

Example of usage of the search structure

The following simple example with a complete single-row cylindrical roller bearing is given in order to make it easier to understand the use of the search structure in a computer program based on this International Standard. With the search program, the following selections are made in a simulated computer program.

Click the **Non-leaf characterization class** button and the following non-leaf characterization classes will be shown: "**Ball bearing; Roller bearing; Insert bearing; etc.**" (See Table 1).

Select **Roller bearing.**

Click the **Leaf characterization class** button and the following leaf characterization classes will be shown: "**Cylindrical roller bearing; Thrust cylindrical roller bearing; Needle roller bearing; etc.**" (See Table 1).

Select **Cylindrical roller bearing.**

Click the **Property** button and the following properties will be shown: "**Number of rows; Bearing part; Number of ribs, outer ring; Number of ribs, inner ring; etc.**" (See 5.3.1).

Select **Number of rows** and enter the number of rows in your sample bearing (See 5.3.1).

The properties **Number of rows; Bearing part; Number of ribs, outer ring; Number of ribs, inner ring; etc.** will be shown again.

Select **Bearing part** and the following value domains will be shown: "**Complete bearing; Bearing without inner ring; Bearing without outer ring; etc.**" (See 5.3.1).

Select **Complete bearing.**

The properties will be shown again and the selection from amongst the value domains of the properties in 5.3.1 continues. When selection of all the available properties and their value domains has been completed, the matching designation(s), availability, etc. will be provided by the computer program.

NOTE 1 All properties selected from the list having Value or Range of number or dimension have these parameters entered by the enquirer to enable a search.

Properties having Number have "Value" entered as an integer

EXAMPLE 1 0, 1, 2, 3, etc.

Properties having "Value/Range" have entered with all know measured significant figures and dimension units applied.

EXAMPLE 2 25 mm; 1.00 inch; 25,4 mm.

NOTE 2 It is, of course, up to the programmer to make a search program user friendly and also make it possible to minimize the number of steps needed to reach a result for a user who knows the product and only wants additional information.

Bibliography

[1] ISO 199, *Rolling bearings — Thrust bearings — Geometrical product specification (GPS) and tolerance values*

[2] ISO 492, *Rolling bearings — Radial bearings — Geometrical product specifications (GPS) and tolerance values*

[3] ISO 3290-1, *Rolling bearings — Balls — Part 1: Steel balls*

[4] ISO 3290-2, *Rolling bearings — Balls — Part 2: Ceramic balls*

[5] ISO 5753-1, *Rolling bearings — Internal clearance — Part 1: Radial internal clearance for radial bearings*

[6] ISO 5753-2, *Rolling bearings — Internal clearance — Part 2: Axial internal clearance for four-point-contact ball bearings*

[7] ISO 10317:2008, *Rolling bearings — Tapered roller bearings — Designation system*

[8] ISO 10317:2008/Amd 1, *Design variant designation and comparison of tolerance class designations for single-row tapered roller bearings*

[9] ISO 12297, *Rolling bearings — Steel cylindrical rollers — Dimensions and tolerances*

[10] ISO 20516, *Rolling bearings — Aligning thrust ball bearings and aligning seat washers — Boundary dimensions*

[11] ISO 22745-2:2010, *Industrial automation systems and integration — Open technical dictionaries and their application to master data — Part 2: Vocabulary*

[12] ISO/TS 23768-1:2011, *Rolling bearings — Parts library — Part 1: Reference dictionary for rolling bearings*

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