

SLOVENSKI STANDARD SIST ISO 76:2001

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Rolling bearings -- Static load ratings

Roulements -- Charges statiques de base ARD PREVIEW

(standards.iteh.ai) Ta slovenski standard je istoveten z: ISO 76:1987

SIST ISO 76:2001

https://standards.iteh.ai/catalog/standards/sist/beae9353-9a90-48f0-8c65a444bb22ab0a/sist-iso-76-2001

ICS:

21.100.20 Kotalni ležaji

Rolling bearings

SIST ISO 76:2001

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<u>SIST ISO 76:2001</u> https://standards.iteh.ai/catalog/standards/sist/beae9353-9a90-48f0-8c65a444bb22ab0a/sist-iso-76-2001

INTERNATIONAL STANDARD



INTERNATIONAL ORGANIZATION FOR STANDARDIZATION ORGANISATION INTERNATIONALE DE NORMALISATION МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Rolling bearings – Static load ratings

Roulements - Charges statiques de base

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<u>SIST ISO 76:2001</u> https://standards.iteh.ai/catalog/standards/sist/beae9353-9a90-48f0-8c65a444bb22ab0a/sist-iso-76-2001 ISO

Second edition 1987-02-01

76

Reference number ISO 76:1987 (E)

SIST ISO 76:2001

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 76 was prepared by Technical Committee ISO/TC 4, Rolling bearings. (standards.iteh.ai)

This second edition cancels and replaces the first edition (ISO 76 13 1978) of which it constitutes a technical revision. https://standards.iteh.ai/catalog/standards/sist/beae9353-9a90-48f0-8c65-

a444bb22ab0a/sist-iso-76-2001

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Rolling bearings – Static load ratings

Introduction 0

Permanent deformations appear in rolling elements and raceways of rolling bearings under static loads of moderate magnitude and increase gradually with increasing load.

It is often impractical to establish whether the deformations appearing in a bearing in a specific application are permissible by testing the bearing in that application. Other methods are therefore required to establish the suitability of the bearing selected.

Experience shows that a total permanent deformation of 0,000 1 of the rolling element diameter, at the centre of the most heavily loaded rolling element/raceway contact, can be tolerated in most bearing applications without the subsequent bearing operation being impaired. The basic static load rating is, therefore, given a magnitude such that approximately this deformation occurs when the static equivalent load is equal to the load rating.

Calculations carried out in accordance with this International Standard do not yield satisfactory results for bearings in which, because of application conditions and/or because of internal design, there is a considerable truncation of the area of contact between the rolling elements and the ring raceways. The same limitation applies where application conditions cause deviations from a normal load distribution in the bearing, for example misalignment, preload or extra large clearance. Where there is reason to assume that such conditions prevail, the user should consult the bearing manufacturer for recommendations and evaluation of static equivalent load.

This International Standard is not applicable to designs where the rolling elements operate directly on a shaft or housing surface, unless that surface is equivalent in all respects to the bearing surface it replaces.

Double-row radial bearings and double-direction thrust bearings are, when referred to in this International Standard, presumed to be symmetrical.

SIST ISO 76:2001

Tests in different countries indicate r that hai/load of tatherds/sist/beae9353-9a90-48f0-8c65magnitude in question may be considered to correspond to aist-iso-76-2001 calculated contact stress of

- 4 600 MPa¹⁾ for self-aligning ball bearings,
- 4 200 MPa for all other ball bearings, and
- 4 000 MPa for all roller bearings

at the centre of the most heavily loaded rollina element/raceway contact. The formulae and factors for the calculation of the basic static load ratings are based on these contact stresses.

The permissible static equivalent load may be smaller than, equal to or greater than the basic static load rating, depending on the requirements for smoothness of operation and friction, as well as on actual contact surface geometry. Bearing users without previous experience of these conditions should consult the bearing manufacturers.

Scope and field of application 1

This International Standard specifies methods of calculating the basic static load rating and the static equivalent load for rolling bearings within the size ranges shown in the relevant International Standards, manufactured from good quality hardened steel, in accordance with good manufacturing practice and basically of conventional design as regards the shape of rolling contact surfaces.

1) $1 \text{ MPa} = 1 \text{ N/mm}^2$

2 Definitions

For the purposes of this International Standard, the following definitions apply.

2.1 static load: The load acting on a bearing when the speed of rotation of its rings in relation to each other is zero.

2.2 basic static radial load rating, Cor: Static radial load which corresponds to a calculated contact stress at the centre of the most heavily loaded rolling element/raceway contact of

- 4 600 MPa for self-aligning ball bearings;
- 4 200 MPa for all other radial ball bearing types;
- 4 000 MPa for all radial roller bearings.

In the case of a single-row angular contact bearing, the radial load rating refers to the radial component of that load which causes a purely radial displacement of the bearing rings in relation to each other.

NOTE - For these contact stresses, a total permanent deformation of rolling element and raceway occurs which is approximately 0,000 1 of the rolling element diameter.

2.3 basic static axial load rating, Coa: Static centric axial load which corresponds to a calculated contact stress at the centre of the most heavily loaded rolling element/raceway contact of

- 4 200 MPa for thrust ball bearings;
- 4 000 MPa for all thrust roller bearings.

NOTE - For these contact stresses, a total permanent deformation of rolling element and raceway occurs which is approximately 0,000 1 of the rolling element diameter.

2.4 static equivalent radial load, Por: Static radial load which would cause the same contact stress at the centre of the most heavily loaded rolling element/raceway contact as that which occurs under the actual load conditions.

2.5 static equivalent axial load, Poa: Static centric axial load which would cause the same contact stress at the centre of the most heavily loaded rolling element/raceway contact as that which occurs under the actual load conditions.

2.6 roller diameter (applicable in the calculation of load ratings), $D_{\rm we}$: The diameter at the middle of the roller.

NOTE - For a tapered roller, this is equal to the mean value of the diameters at the theoretical sharp corners at the large end and the small end of the roller. standar

For an asymmetrical convex roller, this is an approximation for the = number of rows of rolling elements in a bearing diameter at the point of contact between the roller and the ribless i raceway at zero load.

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2.7 roller length (applicable in the calculation of 44 bad 2ab0a/sist-iso-76-2001 ratings), Lwe: The theoretical maximum length of contact between a roller and that raceway where the contact is shortest.

NOTE - This is normally taken to be either the distance between the theoretical sharp corners of the roller minus the roller chamfers or the raceway width excluding the grinding undercuts, whichever is the smaller.

nominal contact angle, α : The angle between a plane 2.8 perpendicular to the bearing axis and the nominal line of the resultant of the forces transmitted by a bearing ring to a rolling element.

Pitch diameter, D_{pw} 2.9

2.9.1 pitch diameter of a ball set: The diameter of the circle containing the centres of the balls in one row in a bearing.

2.9.2 pitch diameter of a roller set: The diameter of the circle intersecting the roller axes at the middle of the rollers in one row in a bearing.

Symbols 3

$C_{\rm or}$ =	= basi	c static	radial	load	rating,	in	newtons
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 C_{oa} = basic static axial load rating, in newtons

 D_{pw} = pitch diameter of a ball or roller set, in millimetres

- $D_{\rm w}$ = ball diameter, in millimetres
- D_{we} = roller diameter applicable in the calculation of load ratings, in millimetres
- L_{we} = roller length applicable in the calculation of load ratings, in millimetres
- bearing radial load = radial component of actual bear- $F_{\rm r}$ ing load, in newtons
- bearing axial load = axial component of actual bearing F_{a} load, in newtons
- $P_{\rm or}$ = static equivalent radial load, in newtons
- Poa = static equivalent axial load, in newtons
- X_0 = radial load factor
- Y_{0} = axial load factor
 - = number of rolling elements in a single row bearing; number of rolling elements per row of a multi-row bearing with the same number of rolling elements per row R
 - factor which depends on the geometry of the bearing S.It components and on the applicable stress level

 $\frac{\text{SIST ISO 76:2001}}{\alpha} = \frac{\alpha}{1000} \text{ for a bearing, in degrees}$ https://standards.iteh.ai/catalog/standards/sist/beae9353-9a90-4810-8c65-

4 Radial ball bearings

4.1 Basic static radial load rating

The basic static radial load rating for radial ball bearings is given by the formula

$$C_{\rm or} = f_0 i Z D_w^2 \cos \alpha$$

where the values of f_{0} are given in table 1.

The formula applies to bearings with a cross-sectional raceway groove radius not larger than 0,52 D_w in radial and angular contact groove ball bearing inner rings and 0,53 D_w in radial and angular contact groove ball bearing outer rings and selfaligning ball bearing inner rings.

The load-carrying ability of a bearing is not necessarily increased by the use of a smaller groove radius, but is reduced by the use of a groove radius larger than those indicated in the previous paragraph. In the latter case, a correspondingly reduced value of f_0 shall be used.

	Factor f _o			4.1.1.1 The basic static radial load rating for two similar				
D cosa	Radial bal	l bearings		single-row radial or angular contact ball bearings mounter by side on the same shaft such that they operate as a				
$\frac{D_{\rm w}\cos\alpha}{D_{\rm pw}}$	Radial and angular contact groove ball bearings	Self-aligning ball bearings	Thrust ball bearings					e as a un e'' arrange
0	14,7	1,9	61,6	1110 The basis statis	امالم		for the	
0.01	14.0	2	60.9	4.1.1.2 The basic static				
0,01	14,9	2	60,8	similar single-row radial		-		
0,02	15,1	2	59,9	mounted side by side on th				
0,03	15,3	2,1	59,1	as a unit (paired or stack n				
0,04	15,5	2,1	58,3 57,5	properly manufactured ar			-	
0,05	15,7	2,1	57,5	tion, is the number of bea	arings ti	mes the rat	ing of	one singl
0.00	15.0	2.2	FG 7	row bearing.	-		-	
0,06	15,9	2,2	56,7	Ũ				
0,07	16,1	2,2	55,9					
0,08	16,3	2,3	55,1	4.2 Static equivalen	t radia	I load		
0,09	16,5	2,3	54,3 52 5					
0,1	16,4	2,4	53,5	The static equivalent radia	al load	for radial b	all bea	rings is th
0.11	10.1	2.4	F0 7	greater of the two values				U
0,11	16,1	2,4	52,7	3	0	,		
0,12	15,9	2,4	51,9	$P_{\rm or} = X_{\rm o}F_{\rm r} + Y_{\rm o}F_{\rm a}$				
0,13	15,6	2,5	51,2	$I_{or} = X_0 I_r + I_0 I_a$				
0,14	15,4	2,5	50,4	$P_{\rm or} = F_{\rm r}$				
0,15	15,2	2,6	49,6					
0,16	14,9	2,6	48,8	where the values of factor	rs X _o ar	nd Y_{o} are gi	iven in	table 2.
0,17	14,7	Tel ₃ STA	N48 47,3	RD PREVIEW				
0,18	14,4							
		2,7		Values of Y_{o} for intermed	liate co	intact angle	s are o	obtained l
0,19 0,2	14,4 14,2 14	^{2,8} 2,8 (St 2	47,3 46,5 n 4 5,7 r d	Values of <i>Y</i> _o for intermed site linear interpolation.	liate co	ntact angle	s are o	obtained t
0,19	14,2	2,8 2,8 (Sta 2,8	n46,5 770	S.Iten.al				
0,19 0,2 0,21 0,22	14,2 14 13,7 13,5	2,8 2,8 (Sta 2,8 2,9	nd53rd	S.ILCII.21 Table 2 – Valu 76:2001 for rad	ies for			
0,19 0,2 0,21 0,22 0,23	14,2 14 13,7 13,5 13,2 http:	2,8 2,8 (Sta 2,8 2,9 ://standa2,9.iteh.ai/	$\frac{46.5}{S_{44,72}}$	S.item.al Table 2 – Valu 76:2001 for rad ds/sist/ <u>beae9353-9a90-48f0-8c65</u>	ies for lial bal	factors X _o l bearings	, and 3	Y _o
0,19 0,2 0,21 0,22 0,23 0,24	14,2 14 13,7 13,5 13,2 http: 13	2,8 2,8 (Sta 2,8 2,9 ://standa2,9.iteh.ai/ 3 a4/	$\frac{46.5}{S_{44}^{45}}$	S.ILCII.21 Table 2 – Valu 76:2001 for rad	ies for lial bal	factors X _o I bearings gle row	, and) Do	Y _o uble row
0,19 0,2 0,21 0,22 0,23	14,2 14 13,7 13,5 13,2 http:	2,8 2,8 (Sta 2,8 2,9 ://standa2,9.iteh.ai/	$\frac{46.5}{S_{44,72}}$	S.item.al Table 2 – Valu 76:2001 for rad ds/sist/ <u>beae9353-9a90-48f0-8c65</u>	ies for lial bal Sin be	factors X _o I bearings gle row parings	and 3	Y _o uble row earings
0,19 0,2 0,21 0,22 0,23 0,24 0,25	14,2 14 13,7 13,5 13,2 13 12,8	2,8 2,8 (Sta 2,8 2,9 ://standa2;9.iteh.ai/ 3 a44 3	$\frac{46,5}{S_{44}^{45}}$	S.Itemar interpolation. Table 2 – Valu 76:2001 for rad ds/sist/beae9353-9a90-48(0-8c65- st-iso-76-2001	ies for lial bal	factors X _o I bearings gle row	, and) Do	Y _o uble row
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26	14,2 14 13,7 13,5 13,2 13 12,8 12,5	2,8 2,8 (Sta 2,8 2,9 ://standa2,9.iteh.ai/ 3 a44 3,1	$\begin{array}{c} 46.5 \\ \underline{S44}5 \\ \underline{S44}5 \\ \underline{S44}5 \\ \underline{S144}5 \\ $	S.Item.al Table 2 – Valu 76:2001 for rad ds/sist/beae9353-9a90-48f0-8c65- st-iso-76-2001 Bearing type	lies for lial ball Sin be X ₀	factors X_{o} l bearings gle row earings Y_{o}	, and X	Y _o uble row earings Y _o
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3	2,8 2,8 (Sta 2,8 2,9 t//standa2,9.iteh.ai/ 3 3,1 3,1 3,1	$\begin{array}{c} 46.5 \\ \underline{S447_2 ISO} \\ \underline{S447_2 ISO} \\ \underline{S447_2 ISO} \\ \underline{S447_2 ISO} \\ \underline{S1447_2 ISO} \\ \underline{S1477_2 ISO} \\ S1477_2 ISO$	Table 2 — Valu 76:2001 for rad ds/sist/heae9353-9a90-48(0-8c65- st-iso-76-2001 Bearing type Radial contact groove	ies for lial bal Sin be	factors X _o I bearings gle row parings	and 3	Y _o uble row earings
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1	2,8 2,8 (Sta 2,8 2,9 t//standa2,9.iteh.ai/ 3 3,1 3,1 3,1 3,2	$\begin{array}{c} 46.5 \\ \underline{S44,5} \\ \underline{S44,5} \\ \underline{S44,5} \\ \underline{S144,5} \\ S144,$	Table 2 — Valu Table 2 — Valu 76:2001 for rad ds/sist/beac9353-9a90-48t()-8c65 striso-76-2001 Bearing type Radial contact groove ball bearings1)	lial ball	factors X_{o} l bearings gle row parings Y_{o} 0,5	, and 2 Do b X ₀ 0,6	Y _o uble row earings Y _o 0,5
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28 0,29	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1 11,8	2,8 2,8 (Sta 2,8 2,9 t//standa2,9.iteh.ai/ 3 3,1 3,1 3,1 3,2 3,2	$ \begin{array}{c} 46,5 \\ \underline{S44},2 ISO \\ 35,3 I \\ 45,3 I \\ 45,3 I \\ 45,3 I \\ 41,9 \\ 41,2 \\ 40,5 \\ 39,7 \\ 39 \\ \end{array} $	Table 2 – Valu 76:2001 for rad ds/sist/beac9353-9a90-48(f)-8c65 st-iso-76-2001 Bearing type Radial contact groove ball bearings ¹) T5°	lies for lial ball Sin be X ₀ 0,6	factors X _o l bearings gle row earings Y _o 0,5 0,46	, and 2 Do b X ₀ 0,6	Y _o uble row earings Y _o 0,5 0,92
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1	2,8 2,8 (Sta 2,8 2,9 t//standa2,9.iteh.ai/ 3 3,1 3,1 3,1 3,2	$\begin{array}{c} 46.5 \\ \underline{S44,5} \\ \underline{S44,5} \\ \underline{S44,5} \\ \underline{S144,5} \\ S144,$	Table 2 — Valu 76:2001 for rad ds/sist/beac9353-9a90-48(f)-8c65. st-iso-76-2001 Bearing type Radial contact groove ball bearings ¹⁾ 15° 20°	lies for lial ball X_0 0,6 0,5 0,5	factors X _o l bearings gle row earings Y _o 0,5 0,46 0,42	, and 2 Do b X ₀ 0,6 1 1	Y ₀ uble row earings
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28 0,29 0,3	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1 11,8 11,6	2,8 2,8 (St 2 2,8 2,9 ://standa2,9.iteh.ai/ 3 3,1 3,1 3,1 3,2 3,2 3,3	$ \begin{array}{c} 46,5 \\ \underline{S44},2 ISO \\ 35,3 I \\ 45,3 I \\ 45,3 I \\ 45,3 I \\ 41,9 \\ 41,2 \\ 40,5 \\ 39,7 \\ 39 \\ \end{array} $	Table 2 — Valu Table 2 — Valu for rad 76:2001 for rad ds/sist/beac9353-9a90-48(f)-8c65. state st-iso-76-2001 Bearing type Radial contact groove ball bearings ¹⁾ 15° 20° Angular contact 25°	es for lial ball X ₀ 0,6 0,5 0,5 0,5	factors X _o l bearings gle row earings Y _o 0,5 0,46 0,42 0,38	, and 2 Do b X ₀ 0,6	Y ₀ uble row earings Y ₀ 0,5 0,92 0,84 0,76
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28 0,29 0,3	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1 11,8 11,6 11,4	2,8 2,8 (St 2 2,8 2,9 ://standa2,9.iteh.ai/ 3 3,1 3,1 3,1 3,2 3,2 3,3 3,3	46,5 S 4 5 4 5 5 4 5 5 1 1 1 1 1 1 1 1	Table 2 — Valu 76:2001 for rad ds/sist/beae9353-9a90-48(0-8c65- st-iso-76-2001 Bearing type Radial contact groove ball bearings ¹) 15° 20°	lies for lial ball X_0 0,6 0,5 0,5	factors X _o l bearings gle row earings Y _o 0,5 0,46 0,42	, and 2 Do b X ₀ 0,6 1 1	Y ₀ uble row earings
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0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28 0,29 0,3 0,31 0,32 0,33	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1 11,8 11,6 11,4 11,2 10,9	$\begin{array}{c} 2,8\\ 2,8\\ 2,8\\ 2,8\\ 2,9\\ 2,9\\ 2,9\\ 3 \\ 3,1\\ 3,1\\ 3,1\\ 3,2\\ 3,2\\ 3,3\\ 3,3\\ 3,4\\ 3,4\\ 3,4\\ 3,4\\ 3,4\\ 3,4$	46,5 S 44,2 ISO 344,2 ISO 344,2 ISO 344,2 ISO 341,9 41,2 40,5 39,7 39 38,2 37,5 36,8 36	Table 2 — Valu Table 2 — Valu 76:2001 for rad ds/sist/bcac9353-9a90-4&0-8c65 st-iso-76-2001 Bearing type Radial contact groove ball bearings ¹⁾ 15° 20° Angular contact 25° groove ball 30°	Ites for lial ball Sin be X ₀ 0,6 0,5 0,5 0,5 0,5	factors X _o l bearings gle row earings Y _o 0,5 0,46 0,42 0,38 0,33	, and 2 Do b X ₀ 0,6 1 1 1 1	Y ₀ uble row earings
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28 0,29 0,3 0,31 0,32	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1 11,8 11,6 11,4 11,2	$2,8 \\ 2,8 \\ 2,8 \\ 2,8 \\ 2,9 \\ 2,9 \\ 3 \\ 3,1 \\ 3,1 \\ 3,1 \\ 3,2 \\ 3,2 \\ 3,3 \\ 3,3 \\ 3,3 \\ 3,4 \\ 3,4 \\ 3,1 \\ 3,1 \\ 3,2 \\ 3,2 \\ 3,3 \\ 3,4 \\ 3,4 \\ 3 \\ 3,4 \\ 3 \\ 3,4 \\ 3 \\ 3,4 \\ 3 \\ 3,1 \\ 3,1 \\ 3,2 \\ 3,3 \\ 3,4 \\ 3 \\ 3,4 \\ 3 \\ 3,4 \\ 3 \\ 3,1 \\ 3,1 \\ 3,2 \\ 3,3 \\ 3,4 \\ 3 \\ 3,4 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ 3 \\ $	46,5 S S 4 5 3 4 5 4 5 4 5 4 1 ,2 4 4 1 ,2 4 4 5 3 9 ,7 3 3 3 3 3 3 3 3	Sitten and the second	Ites for Iial ball Sin K ₀ 0,6 0,5 0,5 0,5 0,5 0,5 0,5 0,5	factors X _o l bearings gle row earings Y _o 0,5 0,46 0,42 0,38 0,33 0,29	, and 2 Do b X ₀ 0,6 1 1 1 1 1 1	Y ₀ uble row earings
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28 0,29 0,3 0,31 0,32 0,33 0,34 0,35 0,36	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1 11,8 11,6 11,4 11,2 10,9 10,7 10,5 10,3	2,8 2,8 2,8 2,9 c//standa2,9. itch.ai/ 3 3,1 3,1 3,2 3,2 3,2 3,3 3,4 3,4 3,4 3,5 3,5 3,6	46,5 Si44,2 ISO atalo43,5 indar 4bb 42,7 0a/si 41,9 41,2 40,5 39,7 39 38,2 37,5 36,8 36,8 36,3 35,3	Sitten and the second	Ites for lial ball Sin be X ₀ 0,6 0,5 0,5 0,5 0,5 0,5 0,5 0,5	factors X _o l bearings gle row earings Y _o 0,5 0,46 0,42 0,38 0,33 0,29 0,26	, and 2 Do b X ₀ 0,6 1 1 1 1 1 1 1 1 1	Y ₀ uble row earings Y ₀ 0,5 0,92 0,84 0,76 0,66 0,58 0,52 0,44
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28 0,29 0,3 0,31 0,32 0,33 0,34 0,35 0,36 0,37	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1 11,8 11,6 11,4 11,2 10,9 10,7 10,5 10,3 10	2,8 2,8 2,8 2,9 c//standa2,9. itch.ai/ 3 3,1 3,1 3,2 3,2 3,2 3,3 3,3 3,4 3,4 3,4 3,4 3,5 3,5 3,5 3,6 3,6 3,6	46,5 Si44,2 ISO atalo43,5 indar 4bb 42,7 0a/si 41,9 41,2 40,5 39,7 39 38,2 37,5 36,8 36,8 36,3 35,3	Sitten and the second	Ites for Iial ball X ₀ 0,6 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5	factors X _o l bearings y _o 0,5 0,46 0,42 0,38 0,33 0,29 0,26 0,22 0,22 cotα	, and 2 Dot b X ₀ 0,6 1 1 1 1 1 1 1 1 1	Y _o uble row earings Y _o 0,5 0,92 0,84 0,76 0,66 0,58 0,52 0,44 0,44 cot
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28 0,29 0,3 0,31 0,32 0,33 0,34 0,35 0,36 0,37 0,38	14,2 14 13,7 13,5 13,2 https 13 12,8 12,5 12,3 12,1 11,8 11,6 11,4 11,2 10,9 10,7 10,5 10,3 10 9,8	2,8 2,8 2,8 2,9 c//standa2,9. iteh ai/ 3 3,1 3,1 3,2 3,2 3,2 3,3 3,3 3,4 3,4 3,4 3,4 3,5 3,5 3,5 3,6 3,6 3,6 3,7	46,5 Si44,2 ISO atalo43,5 indar 4bb 42,7 0a/si 41,9 41,2 40,5 39,7 39 38,2 37,5 36,8 36,8 36,3 35,3	Sitten and the second state of the second sta	Ites for Iial ball X ₀ 0,6 0,6 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5	factors X_0 l bearings gle row barings Y_0 0,5 0,46 0,42 0,38 0,33 0,29 0,26 0,22 0,22 cot α F_a/C_{or} dependent	, and 2 Dot b X ₀ 0,6 1 1 1 1 1 1 1 1 1	Y _o uble row earings Y _o 0,5 0,92 0,84 0,76 0,66 0,58 0,52 0,44 0,44 cot
0,19 0,2 0,21 0,22 0,23 0,24 0,25 0,26 0,27 0,28 0,29 0,3 0,31 0,32 0,33 0,34 0,35 0,36 0,37	14,2 14 13,7 13,5 13,2 13 12,8 12,5 12,3 12,1 11,8 11,6 11,4 11,2 10,9 10,7 10,5 10,3 10	2,8 2,8 2,8 2,9 c//standa2,9. itch.ai/ 3 3,1 3,1 3,2 3,2 3,2 3,3 3,3 3,4 3,4 3,4 3,4 3,5 3,5 3,5 3,6 3,6 3,6	46,5 Si44,2 ISO atalo43,5 indar 4bb 42,7 0a/si 41,9 41,2 40,5 39,7 39 38,2 37,5 36,8 36,8 36,3 35,3	Sitten and the second	Ites for Iial ball X ₀ 0,6 0,6 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5	factors X_0 l bearings gle row barings Y_0 0,5 0,46 0,42 0,38 0,33 0,29 0,26 0,22 0,22 cot α F_a/C_{or} dependent	, and 2 Dot b X ₀ 0,6 1 1 1 1 1 1 1 1 1	Y _o uble row earings Y _o 0,5 0,92 0,84 0,76 0,66 0,58 0,52 0,44 0,44 cot

1) The table is based on the Hertz' point contact formula with a modulus of elasticity = $2,07 \times 10^5$ MPa and a Poisson's ratio of 0,3. It is assumed that the load distribution for radial ball bearings results in a maximum ball load of $5 \frac{F_r}{Z \cos \alpha}$, and, for thrust ball bearings, $\frac{F_a}{Z \sin \alpha}$. Values of f_0 for intermediate values of $\frac{D_w \cos \alpha}{D_{pw}}$ are obtained by linear interpolation.

Table 1 – Values of factor f_0 for ball bearings¹⁾

4.1.1 Bearing combinations

4.2.1 Bearing combinations

4.2.1.1 When calculating the static equivalent radial load for two similar single-row radial or angular contact ball bearings mounted side by side on the same shaft such that they operate as a unit (paired mounting) in "back-to-back" or "face-to-face" arrangement, the X_0 and Y_0 values for a double-row bearing and the F_r and F_a values for the total loads on the arrangement shall be used.

4.2.1.2 When calculating the static equivalent radial load for two or more similar single-row radial or angular contact ball bearings mounted side by side on the same shaft such that they operate as a unit (paired or stack mounting) in "tandem" arrangement, the X_0 and Y_0 values for a single-row bearing and the F_r and F_a values for the total loads on the arrangement shall be used.

Thrust ball bearings 5

Basic static axial load rating 5.1

The basic static axial load rating for single- or double-direction thrust ball bearings is given by the formula

$$C_{oa} = f_o Z D_w^2 \sin \alpha$$

where the values of f_0 are given in table 1 and Z is the number of balls carrying load in one direction.

The formula applies to bearings with a cross-sectional raceway groove radius not larger than 0,54 D_w.

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6.1.1 Bearing combinations

6.1.1.1 The basic static radial load rating for two similar single-row roller bearings mounted side by side on the same shaft such that they operate as a unit (paired mounting) in "back-to-back" or "face-to-face" arrangement is twice the rating of one single-row bearing.

6.1.1.2 The basic static radial load rating for two or more similar single-row roller bearings mounted side by side on the same shaft such that they operate as a unit (paired or stack mounting) in "tandem" arrangement, properly manufactured and mounted for equal load distribution, is the number of bearings times the rating of one single-row bearing.

6.2 Static equivalent radial load

The static equivalent radial load for roller bearings with $\alpha \neq 0^{\circ}$ is the greater of the two values given by the formulae

$$P_{\rm or} = X_{\rm o}F_{\rm r} + Y_{\rm o}F_{\rm a}$$
$$P_{\rm or} = F_{\rm r}$$

where the values of factors X_0 and Y_0 are given in table 3.

creased by the use of a smaller groove radius, but is reduced by the use of a larger groove radius. In the latter case, a corr		actors $X_{\rm o}$ and $Y_{\rm o}$ logs with $\alpha \neq 0^{\rm o}$		
respondingly reduced value of f_0 shall be used.	Bearing type	X _o	Y _o	
<u>SIST IS</u>	<u>0 76:200</u> Single-row	0,5	0,22 cotα	
https://standards.iteh.ai/catalog/stan	larde/eiet/heae9353_9a90_4Xf0_X	r65_		

5.2	Static equivalent axial lotto://standards.iteh.ai/catalog/stan a444bb22ab0	ards/sist/beae9353-9a90-48f0-8 /sist-iso-76-2001 row	c65- 1	0,44 cot <i>α</i>

The static equivalent axial load for thrust ball bearings with $\alpha \neq 90^{\circ}$ is given by the formula

$$P_{\rm oa} = 2,3 F_{\rm r} \tan \alpha + F_{\rm a}$$

This formula is valid for all ratios of radial load to axial load in the case of double-direction bearings. For single-direction bearings, it is valid where $F_r/F_a \leq 0.44 \cot \alpha$ and gives satisfactory but less conservative values of P_{oa} for $F_{\rm r}/F_{\rm a}$ up to 0,67 cot α .

Thrust ball bearings with $\alpha = 90^{\circ}$ can support axial loads only. The static equivalent axial load for this type of bearing is given by the formula

$$P_{\rm oa} = F_{\rm a}$$

Radial roller bearings

6.1 Basic static radial load rating

The basic static radial load rating for radial roller bearings is given by the formula

$$C_{\rm or} = 44 \left(1 - \frac{D_{\rm we} \cos \alpha}{D_{\rm pw}} \right) i Z L_{\rm we} D_{\rm we} \cos \alpha$$

The static equivalent radial load for radial roller bearings with $\alpha = 0^{\circ}$, and subjected to radial load only, is given by the formula

$$P_{\rm or} = F_{\rm r}$$

NOTE — The ability of radial roller bearings with $\alpha = 0^{\circ}$ to support axial loads varies considerably with bearing design and execution. The bearing user should therefore consult the bearing manufacturer for recommendations regarding the evaluation of equivalent load in cases where bearings with $\alpha = 0^{\circ}$ are subjected to axial load.

6.2.1 Bearing combinations

6.2.1.1 When calculating the static equivalent radial load for two similar single-row angular contact roller bearings mounted side by side on the same shaft such that they operate as a unit (paired mounting) in "back-to-back" or "face-to-face" arrangement, the X_0 and Y_0 values for a double-row bearing and the F_r and F_a for the total loads on the arrangement shall be used.

6.2.1.2 When calculating the static equivalent radial load for two or more similar single-row angular contact roller bearings mounted side by side on the same shaft such that they operate as a unit (paired or stack mounting) in "tandem" arrangement, the X_0 and Y_0 values for a single-row bearing and the F_r and F_a values for the total loads on the arrangement shall be used.