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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 4662-2025

Replacing GB/T 4662-2012

Rolling bearings - Static load ratings

滚动轴承 额定静载荷

(English Translation)

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Table of Contents

Foreword
Introduction
1 Scope
2 Normative references
3 Terms and Definitions

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document replaces GB/T 4662-2012 "Rated Static Load of Rolling Bearings". Compared with GB/T 4662-2012, the only changes are structural adjustments.

Aside from editorial changes, the main technical changes are as follows.

- a) The symbols "E(kappa)", "F(rho)", "K(kappa)", "sumrhoi", "sumrhoe", "gamma", and "kappa" have been added (see Chapter 4);
- b) The specific calculation formula for f_0 has been added [see formula (2), formula (3), formula (4), formula (8), formula (9)].

This document is equivalent to ISO 76:2006 "Rolling bearings - Rated static loads".

The following minimal editorial changes have been made to this document.

---Incorporating the amendments to ISO 76:2006/Amd.1.2017, indicated by a vertical double line in the outer margin of the relevant clauses.

(||) is marked;

---Note 2 has been expanded (see Chapter 1).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Rolling Bearings (SAC/TC98).

Introduction

Under moderate to high static loads, rolling bearings will experience permanent deformation on their rolling elements and raceways. This deformation increases with the increase of the load.

And increase.

For each specific application, the bearing selected must undergo extensive bearing testing to determine whether the deformation produced by the bearing is acceptable.

However, this is often impractical, so other methods are needed to determine whether the selected bearing is suitable.

Experience shows that in most applications, the bearing may have a rolling element diameter at the center of contact between the rolling element and the raceway under maximum load.

The total permanent deformation is 0.0001 times the normal value, without causing any adverse effects on the subsequent operation of the bearing. Therefore, the amount of permanent deformation caused by the normal value is...

The static load is specified as the basic rated static load of the bearing.

Tests show that the basic rated static load can be considered as the following calculated contact stress occurring at the contact center between the rolling element and the raceway under maximum load.

The load corresponding to the force.

---4600MPa¹). Self-aligning ball bearing;

---4200MPa. All other ball bearings;

---4000MPa. All roller bearings.

The calculation formulas and coefficients for the basic static load rating are based on these contact stresses.

Depending on the requirements for operational smoothness and friction, and the geometry of the actual contact surfaces, the allowable equivalent static load can be selected to be small.

The static load is equal to, equal to, or greater than the rated static load. Bearing users lacking experience in this area should consult the bearing manufacturer.

1) 1bar=0.1MPa=10⁵Pa; 1MPa=1N/mm².

Rolling bearing rated static load

1 Scope

This document specifies the calculation methods for the basic static load rating and equivalent static load of rolling bearings.

This document applies to materials whose dimensions conform to relevant standards, are made of commonly used high-quality hardened bearing steel, and are manufactured according to good processing methods.

The shape of the rolling contact surface is basically that of a conventionally designed rolling bearing.

This document also applies to the determination of the static safety factor in heavy-load applications.

This document does not apply to cases where significant interruption occurs in the contact area between the rolling elements and the raceway of the bearing due to usage conditions or/and the internal structure of the bearing.

For bearings, if calculated according to this document, satisfactory results cannot be obtained.

This document also does not apply to situations where the load in the bearing deviates from the normal distribution due to operating conditions, such as misalignment, preload, or excessive load.

Clearance, surface treatment, or coating, etc. If these conditions exist, users should consult with the bearing manufacturer on how to calculate the equivalent static load.

This document does not apply to structures where the rolling elements operate directly on the surface of the shaft or bearing housing, unless that surface is otherwise compatible with the surface it represents.

The bearing surfaces are comparable.

Note 1: The double-row radial bearings and double-direction thrust bearings in this document are assumed to be symmetrical structures.

Note 2: When a set of angular contact ball bearings with a nominal contact angle of 45° is considered as a radial bearing and a thrust bearing, the calculation of the axial static load rating...

There is a discontinuity point, and the calculation method and explanation for the correction of the axial basic rated static load are given in Appendix A.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are listed below.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

ISO 5593 Rolling Bearings Vocabulary Note. GB/T 6930-2024 Rolling Bearings Vocabulary (ISO 5593:2023, IDT) Note. GB/T 7811-2015 Symbols for rolling bearing parameters (ISO 15241:2012, IDT)

3 Terms and Definitions

The terms and definitions defined in ISO 5593, as well as the following terms and definitions, apply to this document.

static load

The load acting on the bearing when the relative rotational speed of the bearing rings or washers is zero.

The radial static load corresponding to the calculated contact stress is generated at the contact center between the rolling element and the raceway under maximum load.

---4600MPa. Self-aligning ball bearing;