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**Rolling bearings — Linear motion rolling  
bearings —**

**Part 1:  
Dynamic load ratings and rating life**

*Roulements — Roulements à mouvement linéaire —*

*Partie 1: Charges dynamiques de base et durée nominale*



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## Foreword

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

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14728-1 was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 8, *Load ratings and life*.

ISO 14728 consists of the following parts, under the general title *Rolling bearings — Linear motion rolling bearings*:

- *Part 1: Dynamic load ratings and rating life*
- *Part 2: Static load ratings*

## Introduction

It is often impractical to establish the suitability of a linear motion rolling bearing selected for a specific application by testing. The following procedures have proved to be an appropriate and convenient substitute for testing:

- life calculation with dynamic load (ISO 14728-1);
- static load safety factor calculation with static load (ISO 14728-2).

The life of a linear motion bearing is given by the distance which one of the raceways moves, in relation to the other raceway, before the first evidence of fatigue develops in the material of one of the raceways or one of the rolling elements.

The formulae for calculating the basic dynamic load ratings are derived from the theory of Lundberg<sup>[1]</sup> and Palmgren<sup>[2]</sup>.

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# Rolling bearings — Linear motion rolling bearings —

## Part 1: Dynamic load ratings and rating life

### 1 Scope

This part of ISO 14728 specifies methods of calculating the basic dynamic load rating and basic rating life for linear motion rolling bearings manufactured from contemporary, commonly used, high quality, hardened bearing steel in accordance with good manufacturing practice and basically of conventional design as regards the shape of the rolling contact surfaces. The life of linear motion rolling bearings is defined and the conditions are established for reliable life calculations.

This part of ISO 14728 is not applicable to designs where the rolling elements operate directly on the slide surface of the machine equipment, unless that surface is equivalent in all respects to the raceway of the linear motion rolling bearing component it replaces.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 281:1990, *Rolling bearings — Dynamic load ratings and rating life*

ISO 5593:1997, *Rolling bearings — Vocabulary*

ISO 15241:2001, *Rolling bearings — Symbols for quantities*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 281, ISO 5593 and the following apply.

#### 3.1

##### **recirculating linear ball bearing, sleeve type, with or without raceway grooves**

basically cylindrical sleeve provided with a number of closed loops of recirculating balls designed to achieve linear rolling motion along a hardened cylindrical shaft

See Figure 1.

**NOTE** The raceways in the sleeve can be designed cylindrical as well as steel inserts with raceway grooves parallel to the axis.