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Rolling bearings — Static load ratings

Roulements — Charges statiques de base



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

This third edition cancels and replaces the second edition (ISO 76:1987), which has been technically revised. It incorporates ISO 76:1987/Amd 1:1999 in Annex A.

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Introduction

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.

Tests in different countries indicate that a load of the magnitude in question can be considered to correspond to a 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 rolling element/raceway contact. The equations and factors for the calculation of the basic static load ratings are based on these contact stresses.

The permissible static equivalent load could 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 will need to consult the bearing manufacturer.

1) 1 bar = 0,1 MPa = 10⁵ Pa; 1 MPa = 1 N/mm²