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ISO 16281

Rolling bearings — Methods for calculating the modified reference rating life for universally loaded rolling bearings

Roulements — Méthodes de calcul de la durée nominale de référence corrigée pour les roulements chargés universellement

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

This first edition of ISO 16281 cancels and replaces the first edition of ISO/TS 16281:2008, which has been technically revised. It also incorporates the Technical Corrigendum ISO/TS 16281:2008/Cor 1:2009.

The main changes are as follows:

— the coordinate system used in drawings and derivation of formulae has been changed to a right-handed coordinate system;

— the calculation of load distribution of cylindrical and tapered bearings has been described in greater detail and provisions for the calculation of load distribution and rating life of spherical roller bearings have been added;

— additional formulae have been given for the calculation of load distribution of hybrid bearings;

— reference geometries and the description of static equilibrium calculation for different bearing types have been moved to an informative annex.

This document is intended to be used in conjunction with ISO 281.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This corrected version of ISO/TS 16281:2025 incorporates the following corrections:

— symbol "d" was changed to "a" in Clause 4 and a domain was included for each symbol "a" to distinguish them;

— the introductory text before Formula (16) was modified and Formula (16) was corrected.

Since publication of the first edition of ISO 281:1990, additional knowledge has been gained regarding the influence on bearing life of contamination, lubrication, internal stresses from mounting, stresses from hardening, fatigue load limit of the material etc. It is therefore now possible to consider factors that have influence on bearing life in a more complete way in the life calculation.

ISO 281 provides a method to put into practice this new knowledge in a consistent way when the modified rating life of a bearing is calculated. However, the calculation method given in ISO 281 cannot consider the influence on life of tilted or misaligned bearings and the influence on life of bearing clearance during operation. ISO/TS 16281:2008 already describes an advanced calculation method, which makes it possible to consider these influences, and in addition provides the most accurate method for estimating the influence of contamination and other factors.

In addition to the content of ISO/TS 16281:2008, this document also addresses the analysis of hybrid bearings with rolling elements made of silicon nitride.

The primary purpose of this document is to provide a unified and manufacturer-independent advanced calculation method that allows for the consideration of actual operating conditions, thus enabling the end user to compare different bearing solutions on the same calculation basis. It is also intended to serve as a manufacturer-independent neutral basis for certification purposes, e.g. as required per IEC 61400-4[1] for bearings in wind turbine gearboxes.

This document is intended to be used for computer programs and together with ISO 281 covers the information needed for life calculations. For accurate life calculations under the operating conditions specified above, this document or advanced computer calculations should be used for determining the dynamic equivalent reference load under different loading conditions.

This document is not intended to supersede other advanced bearing analysis methods that are currently used in the design process as the primary tool for bearing design and selection.