
**Plain bearings — Hydrostatic
plain journal bearings without
drainage grooves under steady-state
conditions —**

Part 1:

**Calculation of oil-lubricated plain
journal bearings without drainage
grooves**

*Paliers lisses — Paliers lisses radiaux hydrostatiques sans rainure
d'écoulement fonctionnant en régime stationnaire —*

*Partie 1: Calcul pour la lubrification des paliers lisses radiaux sans
rainure d'écoulement*

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 8, *Calculation methods for plain bearings and their applications*.

This second edition cancels and replaces the first edition (ISO 12168-1:2001), of which it constitutes a minor revision.

The changes compared to the previous edition are as follows:

- adjustment to ISO/IEC Directives, Part 2:2018;
- correction of typographical errors.

A list of all parts in the ISO 12168 series can be found on the ISO website.

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.

Introduction

The functioning of hydrostatic bearings is characterized by the fact that the supporting pressure of the bearing is generated by external lubrication. The special advantages of hydrostatic bearings are lack of wear, quiet running, wide useable speed range as well as high stiffness and damping capacity. These properties are also the reason for the special importance of hydrostatic bearing units in different fields of application such as machine tools.

The bases of calculation described in this document apply to bearings with different numbers of recesses and different width/diameter ratios for identical recess geometry. In this document, only bearings without oil drainage grooves between the recesses are taken into account. As compared to bearings with oil drainage grooves, this type needs less power with the same stiffness behaviour.

The oil is fed to each bearing recess by means of a common pump with constant pump pressure (system p_{en} = constant) and via preceding linear restrictors (e.g. in the form of capillaries).

The calculation procedures listed in this document enable the user to calculate and assess a given bearing design as well as to design a bearing as a function of some optional parameters. Furthermore, this document contains the design of the required lubrication system including the calculation of the restrictor data.

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