
**Plain bearings — Hydrodynamic plain
thrust pad bearings under steady-state
conditions**

**Part 1:
Calculation of thrust pad bearings**

*Paliers lisses — Paliers de butées hydrodynamiques à patins géométrie
fixe fonctionnant en régime stationnaire*

Partie 1: Calcul des butées à segments



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

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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 3.

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 part of ISO 12131 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12131-1 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 4, *Methods of calculation of plain bearings*.

ISO 12131 consists of the following parts, under the general title *Plain bearings — Hydrodynamic plain thrust pad bearings under steady-state conditions*:

- *Part 1: Calculation of thrust pad bearings*
- *Part 2: Functions for the calculation of thrust pad bearings*
- *Part 3: Guide values for the calculation of thrust pad bearings*

Annex A forms a normative part of this part of ISO 12131.

Plain bearings — Hydrodynamic plain thrust pad bearings under steady-state conditions

Part 1: Calculation of thrust pad bearings

1 Scope

The aim of this part of ISO 12131 is to achieve designs of plain bearings that are reliable in operation, by the application of a calculation method for oil-lubricated hydrodynamic plain bearings with complete separation of the thrust collar and plain bearing surfaces by a film of lubricant ^[1].

This part of ISO 12131 applies to plain thrust bearings with incorporated wedge and supporting surfaces having any ratio of wedge surface length l_{wed} to length of one pad L . It deals with the value $l_{\text{wed}}/L = 0,75$ as this value represents the optimum ratio ^[2]. The ratio of width to length of one pad can be varied in the range $B/L = 0,5$ to 2.

The calculation method described in this part of ISO 12131 can be used for other incorporated gap shapes, e.g. plain thrust bearings with integrated baffle, when for these types the numerical solutions of Reynolds' differential equation are known.

The calculation method serves for designing and optimizing plain thrust bearings e.g. for fans, gear units, pumps, turbines, electrical machines, compressors and machine tools. It is limited to steady-state conditions, i.e. load and angular speed of all rotating parts are constant under continuous operating conditions. Dynamic operating conditions are not included.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 12131. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 12131 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3448:1992, *Industrial liquid lubricants — ISO viscosity classification*

ISO 12131-2:2001, *Plain bearings — Hydrodynamic plain thrust pad bearings under steady-state conditions — Part 2: Functions for the calculation of thrust pad bearings*

ISO 12131-3, *Plain bearings — Hydrodynamic plain thrust pad bearings under steady-state conditions — Part 3: Guide values for the calculation of thrust pad bearings*

3 Fundamentals, assumptions and premises

The calculation is always carried out with the numerical solutions of Reynolds' differential equation for sliding surfaces with finite width, taking into account the physically correct boundary conditions for the generation of pressure.