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

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

*Paliers lisses — Butées hydrodynamiques à patins oscillants fonctionnant
en régime stationnaire —*

Partie 1: Calcul des butées à patins oscillants



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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 12130 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12130-1 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 4, *Methods of calculation of plain bearings*.

ISO 12130 consists of the following parts, under the general title *Plain bearings — Hydrodynamic plain tilting pad thrust bearings under steady-state conditions*:

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

Annex A forms a normative part of this part of ISO 12130.

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

Part 1:

Calculation of tilting pad thrust bearings

1 Scope

The aim of ISO 12130 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.

This part of ISO 12130 applies to plain thrust bearings with tilting-type sliding blocks (tilting pads), where a wedge-shaped lubrication clearance gap is automatically formed during operation. 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 12130 can be used for other gap shapes, e.g. parabolic lubrication clearance gaps, as well as for other types of sliding blocks, e.g. circular sliding blocks, when for these types the numerical solutions of Reynolds' differential equation are present. ISO 12130-2 gives only the characteristic values for the plane wedge-shaped gap; the values are therefore not applicable to tilting pads with axial support.

The calculation method serves for designing and optimizing plain thrust bearings e.g. for fans, gear units, pumps, turbines, electric 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.

This part of ISO 12130 is not applicable to heavily loaded tilting pad thrust bearings.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 12130. 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 12130 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 12130-2, *Plain bearings — Hydrodynamic plain tilting pad thrust bearings under steady-state conditions — Part 2: Functions for calculation of tilting pad thrust bearings*

ISO 12130-3, *Plain bearings — Hydrodynamic plain tilting pad thrust bearings under steady-state conditions — Part 3: Guide values for the calculation of tilting pad thrust bearings*