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

Part 3:

**Guide values for the calculation of thrust
pad bearings**

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

*Partie 3: Paramètres opérationnels admissibles pour le calcul des butées
à segments*



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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 12131-3 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*

Introduction

In order to achieve that pad thrust bearings calculated in accordance with ISO 12131-1 are sufficiently reliable in operation, it is necessary that the calculated operational parameters h_{\min} , T_B or T_2 and \bar{p} do not fall below or exceed the guide values h_{\lim} , T_{\lim} and \bar{p}_{\lim} .

For limiting cases at high specific loads and/or high rotational frequencies, more accurate calculations are necessary taking into consideration thermal, elastic, hydrodynamic and/or turbulence effects.

The guide values represent limiting values in the tribological system plain bearing unit which are dependent on geometry and technology. These are empirical values which still give sufficient reliability in operation even when subjected to slight disturbing influences (see clause 4 of ISO 12131-1:2001).

The empirical values given can be modified for specific fields of application.

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

Part 3:

Guide values for the calculation of thrust pad bearings

1 Scope

This part of ISO 12131 specifies guide values for avoiding damage to thrust-pad bearings in service.

The explanation of the symbols as well as examples for calculation are given in ISO 12131-1.

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 4381, *Plain bearings — Lead and tin casting alloys for multilayer plain bearings.*

ISO 4382-1, *Plain bearings — Copper alloys — Part 1: Cast copper alloys for solid and multilayer thick-walled plain bearings.*

ISO 4382-2, *Plain bearings — Copper alloys — Part 2: Wrought copper alloys for solid plain bearings.*

ISO 4383, *Plain bearings — Multilayer materials for thin-walled plain bearings.*

ISO 12131-1:2001, *Plain bearings — Hydrodynamic plain thrust bearings under steady-state conditions — Part 1: Calculation of thrust pad bearings.*

3 Guide values for avoiding damage caused by wear

To achieve minimum wear and low susceptibility to failure full lubrication of the plain bearing unit is aimed at by taking into account the minimum permissible lubricant film thickness h_{lim} . The lubricant should be free from dirt as this may result in increasing wear, scoring and local overheating which would impair the correct functioning of the plain bearing. If necessary, the lubricant has to be filtered.

The minimum lubricant film thickness $h_{lim,tr}$ as a characteristic value for the transition into mixed lubrication (see 5.7 of ISO 12131-1:2001) can be determined in accordance with ^[1] using the following empirical equation:

$$h_{lim,tr} = \sqrt{\frac{D \times R_z}{3\,000}} \quad (1)$$