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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 23892.1-2009

**Plain bearings -- Hydrodynamic plain tilting pad thrust bearings
under steady-state conditions -- Part 1: Calculation of tilting
pad thrust bearings**

滑动轴承 稳态条件下流体动压可倾瓦块止推轴承 第1部分：可倾瓦块止推轴承的
计算

(English Translation)

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Table of Contents

- Foreword
- 1 Scope
- 2 Normative references
- 3 Basic principles, assumptions and preconditions

Foreword

GB/T 23892 "under steady-state conditions bearing hydrodynamic tilting pad thrust bearing" consists of the following three parts.

- Part 1. calculation of tilting pad thrust bearing block stop;
- Part 2. tilting pad thrust bearing calculation function of the stops;
- Part 3. Calculate bearing tilting pad push the allowable value of the stops.

This part of GB/T 23892 Part 1.

This section identical with ISO 12130-1:2001 "hydrodynamic plain bearings under steady-state conditions tilting pad thrust bearing Part 1 Score. tilting pad thrust bearing calculation of the stops. " this section is equivalent translation ISO 12130-1:2001.

This part of International Standard of some technical errors were modified, modifications are as follows.

- "Range" in the "axial support" to "support centers";
- 5.6.4 in, " $Q \geq Q$ " to " $Q \geq Q_3$ ";
- A. 2, ISO original text " $\Delta T_1 = 0.92 \times 0.250.5 \times 0.467 + (1-0.5) \times 0.25 = 13.1K$ "Error, to" $\Delta T_1 = 0.92-0.25 0.5 \times 0.467 + (1-0.5) \times 0.25 \times 7.0 = 13.1K$. " for ease of use, this section made the following editorial changes.
- "This International Standard" be replaced by "this section";
- With a decimal point instead of a comma as the decimal point, "";
- Delete international standards foreword.

Appendix A of this part is a normative appendix.

This part is proposed by China Machinery Industry Federation.

Bearing this in part by the National Standardization Technical Committee (SAC/TC236) centralized.

This section is responsible for drafting unit. Productivity Promotion Center in the machine.

Participated in the drafting of this section. Xi'an Jiaotong University, Shanghai, Zhejiang send Bearing Co., Ltd., Zhejiang Bearing Co., Ltd. Shanghai Branch, Zhejiang Oriental Bearing Co., Ltd., Zhejiang Changsheng Bearing Co., Ltd., Zhejiang SF Oilless Bearing Co., Ltd.

This part of the National Standardization Technical Committee Secretariat slide bearing responsible for the interpretation.

This section first release.

GB/T 23892.1-2009/ISO 12130-1:2001 Under steady-state conditions Bearing Hydrodynamic tilting pad thrust bearing Part 1. Calculation of tilting pad thrust bearing block

1 Scope

This section GB/T 23892 gives the thrust ring and the bearing surfaces are completely separated from the fluid lubricant film hydrodynamic lubrication tilting Design Calculation Method pad thrust bearing, designed for reliable operation of the fluid dynamic pressure tilting pad thrust bearing.

GB/T 23892 in this section applies to the tile width to length ratio B/L in the range of 0.5 to 2, at runtime, automatically form a wedge Lubricating gap tilting pad thrust bearing.

When given the corresponding Reynolds differential equations numerical solution, the calculation method GB/T 23892 is described in this section can also be used for other forms of Wedge-shaped, parabolic lubricating gap, as well as other shapes of tile, for example, a circular pad. GB/T 23892.2-2009 only to the property values of the wedge out of the ordinary wedge, so these values do not apply to the central support of the tilting pads.

This calculation method may be part of a lot of the mechanical thrust bearing only designed and optimized, for example, blowers, gears, pumps, Turbines, motors, compressors and machine tools thrust sliding bearings. It applies only to stable working conditions, for example, in continuous operation Conditions, all rotating parts of the load and the angular velocity is constant.

This section GB/T 23892 does not apply to heavy loads of tilting pad thrust bearing.

2 Normative references

The following documents contain provisions which, through reference GB/T 23892 in this section constitute provisions of this section. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to

use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB/T 3141-1994 Industrial liquid lubricants - ISO viscosity classification (equiv ISO 3448.1992) by GB/T 23892.2-2009 Plain bearings steady state condition hydrodynamic tilting pad thrust bearings - Part 2. tilting pad Calculation function of the thrust bearing (ISO 12130-2:2001, IDT) GB/T 23892.3-2009 Plain bearings under steady-state conditions of hydrodynamic tilting pad thrust bearings - Part 3. tilting pad Push Calculate bearing allowable only with the value (ISO 12130-3:2001, IDT)

3 Basic principles, assumptions and preconditions

Calculation of numerical solution of differential equations Renault sliding surface is always assumed to be finite width, boundary conditions and considering the actual pressure generated, See equation (1).

References [1] is a differential equation derivation formula Renault, [2] is a numerical Reynolds differential equation.

Formula (1) solving, use the following idealized assumptions and premises, the reliability of these assumptions have been obtained in the test and engineering practice to fully verify (see [3]).

- a) Lubricant Newtonian fluid;
- b) the lubricant flow is laminar;
- c) lubricants completely adhered to the sliding surface;

GB/T 23892.1-2009/ISO 12130-1:2001