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

GB/T 28279.1-2012

**Plain bearing -- Hydrostatic plain journal bearings with drainage
grooves under steady-state conditions -- Part 1: Calculation of
oil-lubricated plain journal bearings with drainage grooves**

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Foreword

GB/T 28279 "back to plain bearings under steady-state conditions sump hydrostatic radial sliding bearings" consists of two parts.

--- Part 1. back to the sump oil lubrication Radial calculate sliding bearings;

--- Part 2. back to the sump oil lubrication radial sliding bearings calculated property values.

This part of GB/T 28279 Part 1.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This section uses the translation method identical with the international standard ISO 12167-1.2001 under the path back to the sump static "bearing steady-state conditions

To plain bearings - Part 1. back to the sump oil lubrication Radial sliding bearing calculation.
"

Consistency correspondence between this part of international documents and normative references of our files are as follows.

--- GB/T 3141-1994 industrial liquid lubricants ISO viscosity classification (eqv ISO 3448.1992).

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, Tymoshenko sliding bearing Co., Ltd., Shanghai, Zhejiang send Bearing Co., Ltd.,

Zhejiang Oriental Bearing Co., Ltd., Dongfang Turbine Co., Ltd., Dongfang Electrical Machinery Co., Ltd., Oriental Bearing Co., Ltd. Lin'an.

Introduction

Works hydrostatic bearing is lubricated by the supporting force is generated by an external lubricating oil pressure. Prominent feature hydrostatic lubrication is wear

A small amount of noise, wide operating speed range as well as high stiffness and high impedance. These properties determine the static pressure journal bearing, in many cases, e.g.

The special importance of machine tool applications.

GB /basic calculations in this section T 28279 may be applied to a different number of oil chamber, oil chamber geometry similar width to diameter ratio of different hydrostatic Bearings.

Lubricating oil supplied by the constant pressure pump (pen = system pressure constant) via the pre-restrictor, such as a capillary restriction lubricating oil into each cavity.

GB/T he rear part of the calculation procedures listed T 28279 can be used to calculate and evaluate a given design parameters of hydrostatic bearings can also be

In static variable parameters for the design part of the bearing. In addition, this section GB/T 28279 also contains the required lubrication system design,

Including the calculation of restrictor parameters.

Back to the sump hydrostatic sliding bearings steady-state conditions

Pressure radial sliding bearings - Part 1. back to the oil sump

Lubricated radial sliding bearings Calculation

1 Scope

Oil lubrication hydrostatic radial part of the GB/T 28279 for sump back sliding bearing calculations.

This section applies to a hydrostatic radial bearing under steady-state conditions.

This section is only between the oil chamber back to the oil sump lubrication. Compared with no back to the sump of the hydrostatic radial sliding bearings, in phase

Stiffness under the same circumstances, back sump lubrication pump requires more power.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein

Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 28279.2-2012 Plain bearings back under steady-state conditions sump the hydrostatic radial bearings - Part 2. back

Sump oil lubrication Radial Bearing calculated using characteristic values
ISO 12167-2:2001, IDT).

ISO 3448:1992 Industrial liquid lubricants ISO viscosity classification
(Industrial liquid lubricants-ISO viscosity classification)

The basic principle and boundary conditions calculated 3

Etc. This part of the purpose of the calculation is to determine the precise bearing hydrostatic bearing operating parameters and operating conditions, the geometry and lubricants

Functional relationship. That is determined bearing eccentricity, bearing capacity, oil film rigidity, oil pressure, oil flow, friction power, pump power and

Many parameters temperature rise. In addition to considering the hydrostatic bearing, the hydrodynamic bearing effect also made approximations.

Reynolds equation for the hydrostatic bearing calculation provides a theoretical basis. However, in most practical applications, it can be approximated by

In order to achieve the desired accuracy.

Approximation method used in this section are two integral equations to describe the state of the lubricating oil flowing through the bearing and journal surface of the gap.

Both integral equation can be derived from the Reynolds equation using specific boundary conditions. Hagen - Park Bernoulli equation describes the parallel surface gap

Pressure flow, Kurt formula described by the rotation of the journal bearing gap generated shear flow. Appendix A contains a calculation and theoretical

Based on a detailed description.

Calculation process described in this section is used in the following key assumptions.

- a) the lubricant flow is laminar.
- b) lubricants fully adhered to the surface to be lubricated.
- c) lubricating oil is incompressible Newtonian fluid.
- d) throughout the lubrication gap and pre-restrictor lubricating oil viscosity, etc. are.

- e) completely filled with lubricant in the lubrication gap.
- f) film thickness direction of the pressure gradient is zero.
- g) journal and the pad surface constituting the lubricating gap is rigid.

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