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

GB/T 2889.7-2026

**Plain bearings - Terms, definitions, classification and symbols -
Part 7: Hydrostatic and aerostatic bearings**

滑动轴承 术语、定义、分类和符号 第7部分：液体和气体静压轴承

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1 Scope

GB/T 2889.7-2026 is the Chinese national standard covering the vocabulary of externally pressurised bearings - where the film is supplied by a pump rather than generated by rotation, which is what allows a spindle or a table to run with no contact even at rest. Part 7 of the series, first edition, in force since 1 June 2026. It was issued on 27 February 2026 and has been in force since 1 June 2026, as a first edition. The document is under the responsibility of the China Machinery Industry Federation. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document defines the relevant terms and definitions for liquid hydrostatic bearings and gas hydrostatic bearings. This document applies to all organizations engaged in the research, production, and application of liquid hydrostatic bearings and gas hydrostatic bearings, and is intended for use in conducting related technical exchanges. It is used in work activities such as process flow, technical document preparation, standard setting, and cooperation negotiation, and also provides support for the compilation of related textbooks, periodicals, and document translation. For reference only.

2 Normative references

This document has no normative references.

4 Fluid Mechanics Related Terminology

4.1 flow The motion of a fluid caused by a pressure difference or external force.

4.2 flowrate The volume or mass of fluid passing through the effective cross-section of the flow channel per unit time.

4.2.1 volumetric flow rate (volumetricflow) The volume of fluid passing through the effective cross-section of the flow channel per unit time.

4.2.2 mass flow The mass of fluid flowing through the effective cross-section of the flow channel per unit time.

4.3 pressure The force exerted vertically on a unit area of its constrained body by the fluid.

4.4 differential pressure The difference in pressure between any two points in the same flow field.

4.5 fluid density The mass of a unit volume of fluid under specified temperature and pressure.

4.6 Newtonian fluid Fluids that obey Newton's law of viscosity, meaning that shear stress is proportional to shear rate. [Source: GB/T 2889.3-2020, 3.5.3]

4.7 Viscosity A physical quantity that measures the viscosity of a fluid. The volumetric property of a liquid, liquid-like, or solid-like substance resisting flow, i.e., its resistance to flow under external forces. At that time, the internal friction or flow resistance exhibited between molecules.

4.7.1 dynamic viscosity absolute viscosity The internal friction force is a measure of the fluid's internal friction when it flows under a certain shear stress; it is the ratio of the fluid's shear stress to its shear rate.

Note. Usually expressed as dynamic viscosity coefficient, or simply viscosity. In the International System of Units (SI), the unit of dynamic viscosity is the pascal-second (Pa·s). Practical usage factor. More convenient, the commonly used unit is centipoise (1 cP = 1 mPa·s).

4.7.2 kinematic viscosity The ratio of the dynamic viscosity of a fluid to its density at a given temperature.

Note. In the International System of Units (SI), the unit of kinematic viscosity is square meters per second (m²/s). Some documents also use the unit centistokes (cSt), which is 10⁻⁶ m²/s. (1cSt=1mm²/s). [Source:

GB/T 17446-2024, 3.1.3.35, with modifications]

5 Structure and Classification of Hydrostatic Bearings

5.1 Aerostatic bearing; hydrostatic gas/air bearing A sliding bearing that operates under gas hydrostatic lubrication.

5.2 A sliding bearing that operates under hydrostatic lubrication.

5.3 Radial bearings (journalbearing) A bearing that bears radial (perpendicular to the axis of rotation) loads. [Source:

GB/T 2889.1-2020, 3.2.2.1]

5.4 Thrust bearing A bearing that bears axial loads (along or parallel to the axis of rotation). [Source:

GB/T 2889.1-2020, 3.2.2.2, with modifications]

5.5 Radial thrust bearing (journalthrustbearing) A bearing that can withstand both radial and axial loads. [Source:

GB/T 2889.1-2020, 3.2.2.3, with modifications]

5.6 Cylindrical bearing A radial sliding bearing in which the cross-section of each inner hole perpendicular to the axis is a circle of the same diameter. [Source:

GB/T 2889.1-2020, 3.2.4.1, with modifications]

5.7 Non-cylindrical bearing profile bearing Radial bearings with non-circular cross-sections in their inner bores. [Source:

GB/T 2889.1-2020, 3.2.4.2, with modifications]

5.8 annular thrust bearing A thrust bearing with an annular working surface.

5.9 Circular pad bearing A thrust bearing with a circular working surface.

5.24 Orifice-type throttle

5.24.1 orifice restrictor In hydrostatic bearings, a component that uses a small hole as a throttling channel is formed. Its structure consists of a small-diameter channel machined into the throttling component.

Note. The aperture is usually in the range of 0.3mm to 1.2mm, and the length-to-aperture ratio is usually less than 1, but can be as high as 5.

5.24.2 A small-orifice throttling device that uses the cylindrical surface formed between the orifice and the grinding surface as the throttling surface.

5.25 Annulus restrictor In hydrostatic bearings, a continuous annular gap is used as a throttling channel.

5.26 capillary restrictor A device in hydrostatic bearings that uses a slender tube (capillary tube) as a throttling element.

Note. Its structure is usually small in inner diameter and has a length-to-diameter ratio greater than 100.

5.27 Slot restrictor A component in a hydrostatic bearing that acts as a throttling channel

through a narrow gap (slit).

Note. Its structure is usually a narrow slit formed by two parallel surfaces, and the slit width is mostly on the order of micrometers.

6 Fluid supply and control system

6.1 A system that uses a fluid supply device to provide a constant flow rate of fluid to each oil inlet or air inlet.

Note. Hydrostatic bearings are typically designed with constant current supply in mind.

6.2 A system that uses a fluid supply device to provide constant pressure fluid to each oil inlet or air inlet.

Note. Gas static bearings are typically supplied with a constant pressure system.

6.3 Fluid power supply An energy source that generates and sustains the flow of pressurized fluids. [Source:

GB/T 17446-2024, 3.1.2.65, with modifications]

6.4 Pressure supply line; supply line The flow channel that supplies fluid from the hydrodynamic source to the bearing. [Source:

GB/T 17446-2024, 3.1.6.3, with modifications]

6.5 return line This allows the lubricating oil to return to the oil tank via a flow path. [Source:

GB/T 17446-2024, 3.1.6.4, with modifications]

6.6 Piping Any combination of pipe fittings, hose fittings, rigid pipes and/or hoses that allows fluid to flow from outside the bearing. [Source: GB/T 17446-2024, 3.7.1]

6.7 Screen coarse filter strainer A filter with a braided wire structure that only traps large particles. [Source:

GB/T 17446-2024, 3.8.2, with modifications]

6.8 filter Components that trap particulate contaminants in fluids. [Source:

7 Operating parameters

7.1 Float Under membrane pressure between the bearing and the supported component, the bearing and the supported component are separated by a certain distance.

7.2 steady state In a bearing system, various parameters (such as pressure, flow rate, temperature, lubricating film thickness, etc.) remain constant and do not change over time.

Note. This state is usually achieved after the system reaches equilibrium, at which point the fluid dynamics and thermodynamic parameters inside the system no longer change.