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**Plain bearings—
Terms, definitions and classification—
Part 3 : Lubrication**

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Reference number : JIS B 0162-3 : 2006 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from The Japan Society of Mechanical Engineers (JSME)/Japanese Standards Association (JSA) with a draft being attached based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

This Standard has been made based on **ISO 4378-3:1983** *Plain bearings—Terms, definitions and classification—Part 3 : Lubrication* for the purposes of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

JIS B 0162 series consists of the following parts under the general title “*Plain bearings—Terms, definitions and classification*”

Part 1 : Design, bearing materials and their properties

Part 2 : Friction and wear

Part 3 : Lubrication

Part 4 : Calculation parameters and their symbol

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Plain bearings—Terms, definitions and classification—Part 3 : Lubrication

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **ISO 4378-3** *Plain bearings—Terms, definitions and classification—Part 3 : Lubrication* published in 1983 with some modifications of the technical contents.

The portions given sidelines or dotted underlines are the matters in which the contents of the original International Standard have been modified. A list of modifications with explanations is given in Annex (informative).

1 Scope This part of **JIS B 0162** gives the most commonly used terms applied in the field of plain bearings lubrication as well as their definitions and classification.

NOTE : The International Standard corresponding to this part of **JIS B 0162** is as follows.

In addition, the symbols which denote the degree of correspondence between the International Standard and **JIS** are IDT (identical), MOD (modified) and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

ISO 4378-3:1983 *Plain bearings—Terms, definitions and classification—Part 3 : Lubrication* (MOD)

2 Classification

- a) **General terms**
- b) **Types of and lubrication, classification**
- c) **Methods of lubrication, classification**
- d) **Lubricants and their components, types of lubricants**
- e) **Basic and applied characteristics of lubricants**

3 Terms and definitions The terms and definitions shall be as given in the following.

In addition, English equivalents are given for information.

NOTES 1 In the case where two terms connected with “,” are given together in the term and English equivalent (informative) columns, these should be employed with priority according to the order.

2 In the case where a term and a part of a term are appended with parentheses “()” in the term and English equivalent (informative) columns, these are terms used based on **ISO** standard.

3 The part appended with parentheses “()” in the definition column is the content which supplements the content of definition.

a) **General terms**

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1.1	潤滑 (のタイプ) 潤滑	ZYUNKATU (NO TAIPU)	lubrication action, which results in reducing of wear, of surface deterioration and/or of friction force	lubrication (type of)
1.2	給油 (の方法) 給油	KYŪYU (NO HÔHÔ)	supplying of a lubricant to rubbing surfaces	lubrication (method of)
1.3	潤滑剤	ZYUNKATU ZAI	substance applied on the rubbing surfaces to reduce wear, surface deterioration and/or friction force	lubricant

b) **Types of lubrication, classification**— **According to physical state of the lubricant**

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
2.1	気体膜潤滑, 気体潤滑	KITAI MAKU ZYUNKATU, KITAI ZYUNKATU	type of lubrication in which the rubbing surfaces of the relatively moving bodies are separated by a gaseous lubricant	gas-film lubrication
2.2	液体膜潤滑, 液体潤滑	EKITAI MAKU ZYUNKATU, EKITAI ZYUNKATU	type of lubrication in which the rubbing surfaces of the relatively moving bodies are separated by a liquid lubricant	liquid-film lubrication
2.2a	流体膜潤滑, 流体潤滑	RYŪTAI MAKU ZYUNKATU, RYŪTAI ZYUNKATU	type of lubrication in which the rubbing surfaces of the relatively moving bodies are separated by a fluid (gaseous or liquid) lubricant	fluid-film lubrication
2.3	固体膜潤滑, 固体潤滑	KOTAI MAKU ZYUNKATU, KOTAI ZYUNKATU	type of lubrication in which the rubbing surfaces of the relatively moving bodies are separated by a liquid lubricant	solid-film lubrication

— According to the separation of the rubbing surface by a lubricant film

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
2.4	動圧流体潤滑	DÔATU RYÛTAI ZYUNKATU	liquid-film lubrication in which the rubbing surface are separated completely due to the self-generated pressure in a liquid film between the relatively moving and fluid-viscous surfaces	hydrodynamic lubrication
2.5	静圧流体潤滑	SEIATU RYÛTAI ZYUNKATU	liquid-film lubrication in which the rubbing surfaces of the bodies in relative motion or in a state of rest are completely separated by the externally pressurized fluid supplied into the gap between the surfaces	hydrostatic lubrication
2.6	動圧気体潤滑	DÔATU KITAI ZYUNKATU	gas-film lubrication in which complete separation of rubbing surfaces is the result of self-generated pressure in the gas film by the relative and gaseous viscosity motion of the surfaces	aerodynamic lubrication
2.7	静圧気体潤滑	SEIATU KITAI ZYUNKATU	gas-film lubrication in which the rubbing surfaces of the bodies in relative motion or in a state of rest are completely separated by the externally pressurized gas supplied into the gap between the surfaces	aerostatic lubrication
2.8	弾性流体潤滑, EHL	DANSEI RYÛTAI ZYUNKATU, î EITI ERU	type of lubrication in which friction and film thickness of the liquid lubricant between the relatively moving surfaces are determined by the elastic properties of the materials as well as by the rheologic properties (especially, dependence of viscosity on pressure) of the lubricant	elasto-hydrodynamic lubrication, EHL
2.9	境界潤滑	KYÔKAI ZYUNKATU	type of lubrication in which friction and wear between two surfaces in relative motion are determined by the properties of the surface and by the properties of the lubricant other than bulk viscosity	boundary lubrication
2.10	混合潤滑	KONGÔ ZYUNKATU	type of lubrication in which there exists liquid-film lubrication and boundary lubrication	mixed lubrication

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
2.10a	熱流体潤滑, THL	NETU RYŪTAI ZYUNKATU, TĪ Ī EITI ERU	type of fluid lubrication in which the lubrication condition between the relatively moving surfaces is determined by the dependence of heat balance of a lubrication film including shear heating, heat transfer and lubricant viscosity on temperature	thermo-hydrodynamic lubrication, THL
2.10b	熱弾性流体潤滑, TEHL	NETUDANSEI RYŪTAI ZYUNKATU, TĪ Ī EITI ERU	type of fluid lubrication in which the lubrication condition between the relatively moving surfaces is determined by the heat balance of a lubrication film including shear heating, heat transfer, elastic properties of friction surfaces and rheologic properties of a lubricant (especially, dependence of viscosity on temperature and pressure)	thermo-elastohydrodynamic lubrication, TEHL
2.10c	ハード EHL	HĀDO Ī EITI ERU	elastic-fluid lubrication condition in which the exponentially increased effects of elastic deformation and viscosity of lubricating oil due to the high pressure appear	hard EHL
2.10d	ソフト EHL	SOHUTO Ī EITI ERU	elastic-fluid lubrication condition in which, in the case of the surface with a small elastic coefficient, the increase of viscosity due to the oil pressure does not appear	soft EHL
2.10e	マイクロ EHL	MAIKURO Ī EITI ERU	lubrication condition in which the protruded tip of surface roughness becomes EHL	micro- EHL
2.10f	層流潤滑	SŌRYŪ ZYUNKATU	lubrication condition in which lubrication fluid particles systematically move drawing a smooth flow line in a steady state, which occurs in the case where the viscous force of a fluid becomes a dominant flow compared with the inertia force, i.e. Reynolds number is comparatively small	laminar flow lubrication

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
2.10g	乱流潤滑	RANRYŪ ZYUNKATU	lubrication condition in which lubrication fluid particles move randomly in disorder temporally and spatially, which occurs in the case where the inertia force of a fluid becomes a dominant flow compared with the viscous force, i.e. Reynolds number is large	turbulent flow lubrication
2.10h	指向潤滑	SIKŌ ZYUNKATU	lubrication method in which the operation is performed with the proper amount of lubricating oil being directly supplied to a part of the lubrication friction surfaces As the representative method, there is the method of the spray of lubricating oil from a nozzle hole to a pad friction surface for industrial tilting pad bearings.	directed lubrication
2.10i	枯渴潤滑	KOKATU ZYUNKATU	lubrication condition in which the lubricant is insufficient	starved lubrication
2.10j	無潤滑	MU ZYUNKATU	being made to slide etc. without using lubricants	non-lubrication
2.10k	グリース潤滑	GURISU ZYUNKATU	being made to slide etc. using greases as the lubricant for a friction part Information: For the standard of grease guns, see JIS B 1575 and JIS B 9808 .	grease lubrication

c) Methods of lubrication, classification

— According to periodicity of application of lubricant

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
3.1	連続潤滑	RENZOKU ZYUNKATU	method of lubrication in which the lubricant is applied continuously	continuous lubrication