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**Plain bearings — Appearance and  
characterization of damage to metallic  
hydrodynamic bearings —**

**Part 1:  
General**

*Paliers lisses — Aspect et caractérisation de l'endommagement des  
paliers métalliques à couche lubrifiante fluide —*

*Partie 1: Généralités*



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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 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 7146-1 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 2, *Materials and lubricants, their properties, characteristics, test methods and testing conditions*.

This first edition of ISO 7146-1, together with ISO 7146-2, cancels and replaces ISO 7146:1993 the technical content of which has been technically revised and augmented.

ISO 7146 consists of the following parts, under the general title *Plain bearings — Appearance and characterization of damage to metallic hydrodynamic bearings*.

- *Part 1: General*
- *Part 2: Cavitation erosion and its countermeasures*

## Introduction

In practice, damage to a bearing may often be the result of several mechanisms operating simultaneously. It is the complex combination of design, manufacture, assembly, operation, maintenance, and possible reconditioning which often causes difficulty in establishing the primary cause of damage.

In the event of extensive damage or destruction of the bearing, the evidence is likely to be lost, and it will then be impossible to identify how the damage came about.

In all cases, knowledge of the actual operating conditions of the assembly and the maintenance history is of the utmost importance.

The classification of bearing damage established in this part of ISO 7146 is based primarily upon the features visible on the running surfaces and elsewhere, and consideration of each aspect is required for reliable determination of the cause of bearing damage.

Since more than one process may cause similar effects on the running surface, a description of appearance alone is occasionally inadequate in determining the cause of damage. Thus Clause 4 is subdivided into several subclauses including damage appearance and damage characteristics.

For the procedure of damage analysis, Clause 5 may give a helpful guide.

In Clauses 6 and 7, examples of all damage characteristics with typically associated damage appearance are given.

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# Plain bearings — Appearance and characterization of damage to metallic hydrodynamic bearings —

## Part 1: General

### 1 Scope

This part of ISO 7146 defines, describes and classifies the characteristics of damage occurring in service to hydrodynamically lubricated metallic plain bearings and journals. It assists in the understanding of the various characteristic forms of damage which may occur.

Consideration is restricted to damage characteristics which have a well-defined appearance and which can be attributed to particular damage causes with a high degree of certainty. Various appearances are illustrated with photographs and diagrams.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4378-1, *Plain bearings — Terms, definitions, classification and symbols — Part 1: Design, bearing materials and their properties*

ISO 4378-2, *Plain bearings — Terms, definitions, classification and symbols — Part 2: Friction and wear*

ISO 4378-3, *Plain bearings — Terms, definitions, classification and symbols — Part 3: Lubrication*

ISO 4378-4, *Plain bearings — Terms, definitions, classification and symbols — Part 4: Basic symbols*

ISO 7146-2, *Plain bearings — Appearance and characterization of damage to metallic hydrodynamic bearings — Part 2: Cavitation erosion and its countermeasures*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4378-1, ISO 4378-2, ISO 4378-3, ISO 4378-4 and the following apply.

#### 3.1

##### **damage to plain bearings**

##### **bearing damage**

all changes in appearance occurring on the bearing surface and/or on the bearing back during operation that adversely affect the performance of the bearing