STANDARD 7905-1

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Plain bearings — Bearing fatigue —

Part 1:
Plain bearings in test rigs and in applications under conditions of hydrodynamic lubrication

Paliers lisses — Fatigue des paliers —

Partie 1: Paliers dans les machines d'essai et dans les applications en lubrification hydrodynamique

Reference number
ISO 7905-1:1995(E)

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.

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.

International Standard ISO 7905-1 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 2, *Materials and lubricants, their properties, characteristics, test methods and testing conditions*.

ISO 7905 consists of the following parts, under the general title *Plain bearings — Bearing fatigue*:

— *Part 1: Plain bearings in test rigs and in applications under conditions of hydrodynamic lubrication*

— *Part 2: Test with a cylindrical specimen of a metallic bearing material*

— *Part 3: Test on plain strips of a metallic multilayer bearing material*

— *Part 4: Tests on half-bearings of a metallic multilayer bearing material*

Annex A forms an integral part of this part of ISO 7905. Annex B is for information only.

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Plain bearings — Bearing fatigue —

Part 1:
Plain bearings in test rigs and in applications under conditions of hydrodynamic lubrication

1 Scope

This part of ISO 7905 describes a method of improving test result comparability by evaluating the stresses in the bearing layers leading to fatigue (see annex A). A similar evaluation is required in practical applications. Because the stresses are the result of pressure build-up in the hydrodynamic film, it is essential to fully state the conditions of operation and lubrication. In addition to dynamic loading, dimensional and running characteristics, the inclusion of the following adequately defines the fatigue system:

a) under conditions of dynamic loading the minimum bearing oil film thickness as a function of time and location to ensure no excessive local overheating or shearing as a result of mixed lubrication when running in;

b) the distribution of pressure circumferentially and axially with time under dynamic loading;

c) from this the resulting stresses in the bearing layers as a function of time and location, especially the maximum alternating stress.

Furthermore, bearing fatigue may be affected by mixed lubrication, wear, dirt, tribochemical reactions and other effects encountered in use thus complicating the fatigue problem. This part of ISO 7905 is therefore restricted to fatigue under full hydrodynamic separation of the bearing surfaces by a lubricant film.

This part of ISO 7905 applies to oil-lubricated plain cylindrical bearings, in test rigs and application running in conditions of full hydrodynamic lubrication. It comprises dynamic loading in bi-metal and multilayer bearings.

NOTE 1 The number of practical applications with different requirements has led to the development of many bearing test rigs. If the conditions of lubrication employed on these test rigs are not defined in detail, test results from different rigs are generally neither comparable nor applicable in practice. Different test rigs may yield inconsistent ranking between equal materials.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7905. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7905 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 468:1982, *Surface roughness — Parameters, their values and general rules for specifying requirements.*

ISO 7902-1:—[1], *Hydrodynamic plain journal bearings under steady-state conditions — Circular cylindrical bearings — Part 1: Calculation procedure.*

ISO 7902-2:—[1], *Hydrodynamic plain journal bearings under steady-state conditions — Circular cylindrical*

1) To be published.