INTERNATIONAL STANDARD

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Plain bearings — Bearing fatigue —

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

Paliers lisses — Fatigue des paliers —

Partie 4: Essais sur demi-coussinets en matériau antifriction métallique multicouche

Reference number
ISO 7905-4:1995(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 7905-4 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 4:
Tests on half-bearings of a metallic multilayer bearing material

1 Scope

This part of ISO 7905 specifies a method for the determination of the endurance limit in fatigue of half-bearings of multilayer bearing 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 4386-3:1992, *Plain bearings — Metallic multilayer plain bearings — Part 3: Non-destructive penetrant testing.*

ISO 7905-3:1995, *Plain bearings — Bearing fatigue — Part 3: Test on plain strips of a metallic multilayer bearing material.*

3 Test specimens

The test specimens shall be half-bearings ready for use. Normally, as a result of the loading conditions, the major stresses are located in the crown area of the bearing. Care should be taken before and during the test not to damage the surface mechanically or by corrosion. The advantage of this method is the presence of residual stress associated with the bearing manufacturing process.

4 Test methods

The test principle is illustrated in figure 1. The specimens shall be clamped at one end and loaded at the other end by force or displacement applied radially at the relief parting line runout. The load shall fluctuate from tension to compression within the running surface. Additionally a tensile or compressive prestress may be applied in order to evaluate dependency upon mean stress. The test equipment is preferably located in a chamber containing a lubricant at fixed levels of temperature to $\pm$ 2 °C. Alternatively tests may be conducted in air at fixed levels of temperature $\pm$ 2 °C.

Bending stress may be measured by a strain gauge on the back of the bearing at the crown (mid-peripheral length). The required stress in the lining can be calculated if the steel and lining thicknesses and Young's modulii are known. Alternatively, the radial force at the clamping end F can be measured by load cell or calculated from cantilever beam theory and the value of stress in the lining calculated according to annex A. The values are critically dependent upon the lining and steel thickness which shall be determined by microsection after the tests. The test frequency shall have a range of 50 Hz to 80 Hz. Crack detection shall be performed by dye penetrant method (see ISO 4386-3) or by microscope.