SLOVENSKI STANDARD
SIST ISO 7905-3:2002

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Drsni leģaji - Utrujanje leģaja - 3. del: Preskuģanje materiala veļ slojnih kovinskih trakov za leģaje

Plain bearings -- Bearing fatigue -- Part 3: Test on plain strips of a metallic multilayer bearing material

Paliers lisses -- Fatigue des paliers -- Partie 3: Essai sur éprouvettes plates en matériau antifriction métallique multicouche

Ta slovenski standard je istoveten z: ISO 7905-3:1995

ICS:

21.100.10	Drsni ležaji	Plain bearings

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INTERNATIONAL STANDARD

ISO 7905-3

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Plain bearings — Bearing fatigue —

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

Paliers lisses — Fatigue des paliers —
Partie 3: Essai sur éprouvettes plates en matériau métallique multicouche

Reference number
ISO 7905-3:1995(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 7905-3 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 of this part of ISO 7905 is for information only.

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Plain bearings — Bearing fatigue —

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

1 Scope

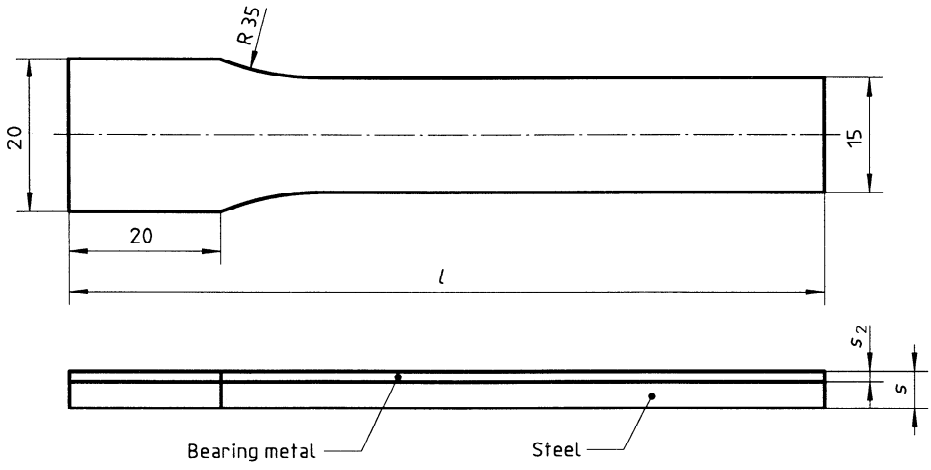
This part of ISO 7905 specifies a method for the determination of the endurance limit in fatigue of plain strips of multilayer bearing materials. Additionally it provides the opportunity of studying the influence on the strips of hydraulic pressure and variable temperature.

2 Test specimens

The test specimens shall be flat thin strips of rectangular cross-section to the dimensions shown in figure 1. To avoid fracture starting at the clamped portion, the edges shall be carefully chamfered by grinding and the test section shall be contured as shown in figure 1.

For a multilayer bearing material, the layer dimensions of the test specimen shall be representative of the manufacturing sequence and the test specimen shall be finished to the same surface texture. Care should be taken before and during the test not to damage the surface mechanically or by corrosion. The deficiency of this test method lies in the absence of possible residual stress associated with the bearing manufacturing process.

Dimensions in millimetres



Nominal thickness s mm	Thickness of bearing metal and/or overlay s_2 mm	Test length l mm
3 to 5	As agreed upon	75 100

Figure 1 — Specimen dimensions and configuration

3 Test method

The test principle is illustrated in figure 2. The specimens shall be clamped at one end and loaded at the other end by force or displacement. The load shall fluctuate from tension to compression over 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 ± 2 °C. Alternatively tests may be conducted in air at fixed levels of temperature ± 2 °C.

Bending stress shall be measured by a strain gauge near the clamping point on the back of the bearing. The required bending stress at the damaged section may be evaluated by calculation, knowing the relative location of the strain gauge and first crack, and the thickness and Young's modulus of the lining and steel backing.

NOTE 1 The stresses in plain layered strips under condition of bending may be evaluated theoretically.

The test frequency shall have a range of 50 to 80 Hertz. Crack detection shall be performed by dye penetrant method or by microscope. The amplitude shall be controlled by force (F) or displacement (s).

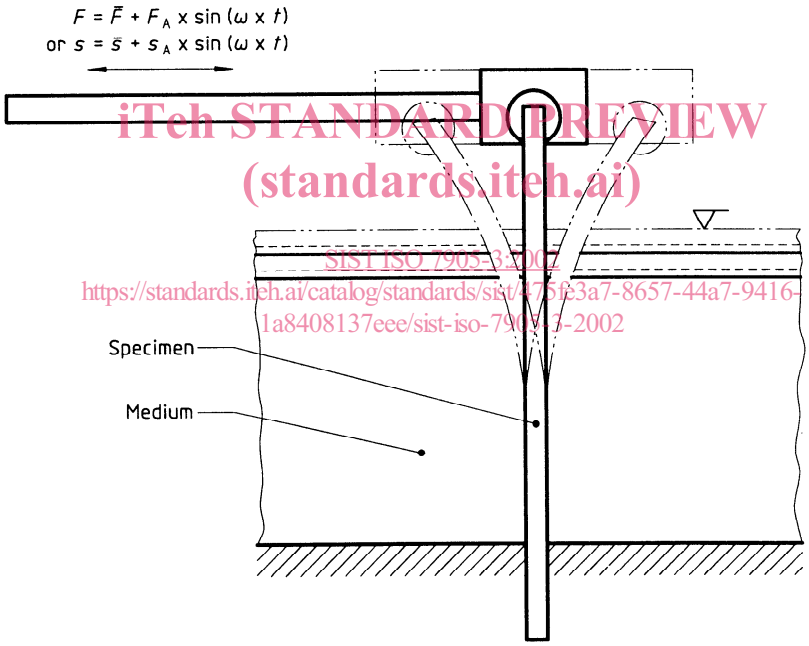


Figure 2 — Test principle

4 Evaluation and presentation of test results

The endurance limit stresses should be presented in the form of σ_{el}-N curves at predetermined temperature ($\pm$ 2 °C) against a detailed description of the bearing material. Normally σ_{el}-N curve testing is terminated for practical considerations at 50×10^6 stress cycles. The endurance limit stress may be quoted at a specified number of cycles e.g. 3×10^6, 10×10^6, 25×10^6 or 50×10^6. A specimen without failure during fatigue testing to a specified endurance should be identified in the report. Due to the scatter of test results normally experienced and the statistical nature of the fatigue limit, it is recommended that the results be evaluated on the basis of a statistical method.

Another presentation of the endurance limit stress may be effected by means of the Haigh diagram which plots stress amplitude against mean stress. Metallographic examination will provide detailed evidence of the damage mechanism, corrosive attack and diffusion resulting from thermal effects.

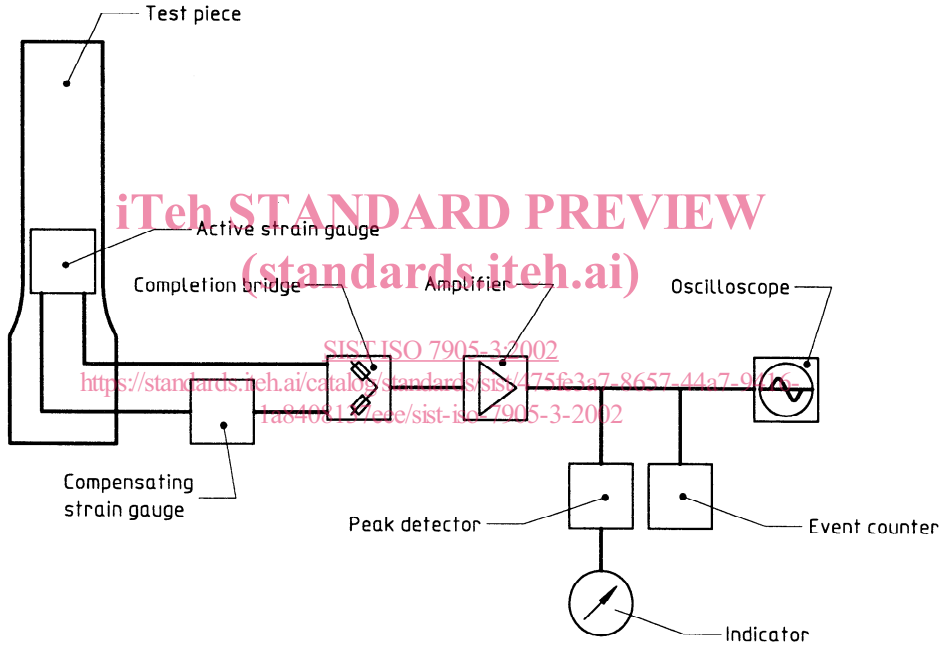


Figure 3 — Event counter recorder

Annex A
(informative)

Bibliography

[1] ISO 3548:1978, *Plain bearings — Thin-walled half bearings — Dimensions, tolerances and methods of checking.*

[2] ISO 4378-1:1983, *Plain bearings — Terms, definitions and classification — Part 1: Design, bearing materials and their properties.*