भारतीय मानक
Indian Standard

IS 14802 (Part 1) : 2024
ISO 4384-1 : 2019

प्लेन बियरिंग — बियरिंग धातुओं की कठोरता परीक्षण

भाग 1 बहुपरत बियरिंग सामग्री

(पहला पुनरीक्षण)

Plain Bearings — Hardness Testing of Bearing Metals

Part 1 Multilayer Bearings Materials

(First Revision)

ICS 21.100.10

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Price Group 3

Bearings Sectional Committee, PGD 13

NATIONAL FOREWORD

This Indian Standard (Part 1) (First Revision) which is identical to ISO 4384-1 : 2019 ‘Plain bearings — Hardness testing of bearing metals — Part 1: Multilayer bearings materials’ issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Bearings Sectional Committee and approval of the Production and General Engineering Division Council.

This standard was first published in 2000 which was identical to ISO 4384-1 : 1982. This revision has been brought out to align the standard to ISO 4384-1 : 2019.

The major changes in this revision are as follows:

a) Normative references **2** have been updated;
b) Test specimen preparation requirements have been modified;
c) Layer thickness and test conditions have been updated; and
d) Test report format has been added.

This standard is published in two parts. The other part in this series is:

Part 2 Solid materials

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’; and
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is given below along with its degree of equivalence for the edition indicated.

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 6506-1 Metallic materials — Brinell hardness test — Part 1: Test method	IS 1500 (Part 1) : 2019/ISO 6506-1 : 2014 Metallic materials — Brinell hardness test: Part 1 Test method (*fifth revision*)	Identical

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’.

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Indian Standard

PLAIN BEARINGS — HARDNESS TESTING OF BEARING METALS

PART 1 MULTILAYER BEARINGS MATERIALS

(First Revision)

1 Scope

This document specifies parameters for the hardness testing of compound materials for plain bearings made from steel and bearing metal with bearing metals based on copper and aluminium, manufactured by casting, sintering or bonding. It represents a supplement to the existing ISO publications on hardness testing and, therefore, includes only the extensions and restrictions to be observed compared to those publications.

The measuring method applied depends on the bearing metal layer thickness, its hardness and its structure.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Specimen

The surface of the specimen in the test area shall be bright metallic and conditioned in such a way that a satisfactory measurement of the test impression is possible. During the preparation of the specimens, it shall be ensured that the material is not heated.

The test surface shall be plane in accordance with ISO 6506-1.

Contrary to ISO 6506-1, the thickness of the test piece shall be at least four times the depth of indentation.

5 Procedure

The test conditions shall be as given in Table 1.

Table 1 — Test conditions

Compound material	Layer thickness of bearing material mm		Test conditions[a]	Test temperature °C
Steel Cu-alloys	≤0,20		Small load hardness testing[b]	18 to 24
	>0,20	≤1,5	HBW 1/10	
	>1,5		HBW 2,5/62,5/30	
Steel Al-alloys	≤0,20		Small load hardness testing[b]	
	>0,20	≤1,5	HBW 1/5/30	
	>1,5		HBW 2,5/31,25/30	
Steel	≤0,5		Small load hardness testing[b]	
	>0,5		HBW 1/30	

[a] EXAMPLE: HBW 2,5/62,5/30 = Brinell hardness determined with a ball of 2,5 mm diameter and with a test force of 612,9 N applied for 30 s.

[b] Not mandatory determination.

6 Test report

The test report shall include the following information:

a) reference to this document, i.e. ISO 4384-1:2019;

b) all details necessary for identification of the test sample;

c) test conditions and result obtained;

d) all operations not specified by this document, or regarded as optional;

e) details of any occurrence which might have affected the result.

NOTE 1 There is no general process of accurately converting Brinell hardness into other scales of hardness or into tensile strength. These conversions, therefore, are intended to be avoided, unless a reliable basis for the conversion can be obtained by comparison tests.

NOTE 2 Note that for anisotropic materials, for example those which have been heavily cold-worked, there will be a difference between the lengths of the two diameters of the indentation. The specification for the product can indicate limits for such differences.

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: PGD 13 (24930).

Amendments Issued Since Publication

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