

Metallic multilayer plain bearings —

Part 3: Method for non-destructive die penetrant testing

Committees responsible for this British Standard

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- Association of Bronze and Brass Founders
- British Plastics Federation
- British Powder Metal Federation
- Copper Development Association
- Institution of Diesel and Gas Turbine Engineers
- Institution of Mechanical Engineers
- Society of Motor Manufacturers and Traders Ltd.

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National foreword

This Part of BS 7585 has been prepared under the direction of the Machinery and Components Standard Policy Committee. It is identical with ISO 4386-3:1992 *Plain bearings — Metallic multilayer plain bearings — Part 3: Non-destructive penetrant testing*, published by the International Organization for Standardization (ISO).

Cross-reference

International Standard	Corresponding British Standard
ISO 4386-1:1992	BS 7585 <i>Metallic multilayer plain bearings</i> Part 1:1992 <i>Method for non-destructive ultrasonic testing of bond</i> (Identical)

NOTE For the purposes of this standard, any reference in the text to penetrant should be taken to mean die penetrant.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This part of ISO 4386 specifies a non-destructive penetrant testing for determining bond defects and discontinuities in the sliding surface of the bearing.

The penetration method is used to detect

- a) bond defects in the transitional area between the bearing backing/bearing material on the end faces and joint faces of multilayer plain bearings which cannot be detected by the ultrasonic testing method specified in ISO 4386-1;
- b) discontinuities in the sliding surface of the bearing.

The penetration method is applicable, in principle, to finished multilayer plain bearings.

The bond test can be carried out only on cast multilayer plain bearings, with a backing consisting of steel, cast steel or cast bronze. Bearing backings which cannot be tin-plated, or only with difficulty, such as perlitic cast iron, rust-resistant steel and cast aluminium, cannot be tested since no bond is possible between the bearing material and bearing backing.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 4386. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 4386 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4386-1:1992, *Plain bearings — Metallic multilayer plain bearings — Part 1: Non-destructive ultrasonic testing of bond*.

3 Safety precautions

As penetrant inspection techniques often require the use of dangerous, flammable and/or volatile materials, the relevant accident prevention, handling of dangerous substances and environmental protection regulations shall be observed.

4 Preparation of test surface

4.1 General

The surfaces to be tested shall be free from residual matter to allow the penetrant to ingress in any discontinuity. Adherent metal splinters and chips caused by machining shall be removed mechanically, and adherent oil and grease removed chemically. Finally, the surface shall be thoroughly dried, at a maximum temperature of 55 °C.

The test surface shall have a surface roughness of $R_a \leq 5 \mu\text{m}$.

4.2 Mechanical pre-cleaning

Rust etc. shall be removed by brushing, by grinding using an abrasive blasting process, or by similar methods. Care shall be taken to ensure that the defects are not sealed by the pre-cleaning process, if necessary, etching is recommended after the use of any mechanical method. The surface shall then be thoroughly rinsed and dried.

4.3 Chemical pre-cleaning

Residual matter shall be removed by means of suitable cleaning materials, e.g. by degreasing solvents, etchants or paint strippers. After use, all traces of cleaning materials shall be removed completely from the test surface and from the discontinuities, e.g. by rinsing the test surface.

4.4 Drying

At the end of the pre-cleaning process, the surfaces to be examined shall be dried so that no water or cleaning material remains in the discontinuities.

5 Application of penetrant

5.1 A penetrant which is removable by water or solvent shall be used for the test. The test temperature, i.e. the temperature of the test surface, shall be between 10 °C and 50 °C.

NOTE 1 A very viscous penetrant increases the safety of the interim cleaning.

5.2 The penetrant shall be applied by immersing the bearing, or by means of a brush, or by spraying. The penetration time shall be 10 min to 60 min. With very viscous penetrants it shall be at least 20 min. The surfaces to be examined shall be wetted continuously during this time.