



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18329.3-2021

**Plain bearings - Metallic multilayer plain bearings - Part 3:
Non-destructive penetrant testing**

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Foreword

GB/T 18329 "Multilayer Metal Sliding Bearings for Sliding Bearings" is divided into the following 4 parts.

---Part 1.Ultrasonic non-destructive testing of bond strength;

---Part 2.Destructive test of bond strength of alloy thickness $\geq 2\text{mm}$;

---Part 3.Non-destructive penetration inspection;

---Part 4.Ultrasonic penetration non-destructive testing of the bonding quality of alloy thickness $\geq 0.3\text{mm}$.

This part is Part 3 of GB/T 18329.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the redrafting method to modify and adopt ISO 4386-3:2018 "Sliding Bearings Multilayer Metal Sliding Bearings Part 3. None

Damage and Penetration Inspection.

The technical differences between this part and ISO 4386-3:2018 and the reasons are as follows.

---Because ASTM E1417 quoted in 8.2 does not correspond to national standards or industry standards, and the penetrant used in domestic production and

The developer products are not currently compliant with ASTM E1417. In order to meet the actual production and use needs of our country, it is added on the basis of the original requirements.

Negotiate the choice of terms and give the possible results in the form of "notes".

This part was proposed by China Machinery Industry Federation.

This part is under the jurisdiction of the National Sliding Bearing Standardization Technical Committee (SAC/TC236).

Drafting organizations of this section: China Machinery Productivity Promotion Center, Hunan Chongde Technology Co., Ltd., Shenke Sliding Bearing Co., Ltd.,

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Sliding Bearing Co., Ltd., Jiaxing Meiteer Baoxin Machinery Industry Co., Ltd.

This part is explained by the National Technical Committee for Standardization of Sliding Bearings.

Multi-layer metal sliding bearings

Part 3. Non-destructive penetrant inspection

1 Scope

This part of GB/T 18329 specifies the non-destructive leakage for determining bearing bonding defects and sliding surface defects (i.e. surface discontinuities).

Through inspection method. This method is suitable for inspection.

a) The end face and the counter face of the multi-layer sliding bearing are located in the transition area between the bearing backing and the bearing alloy material, and cannot be

GB/T 18329.1 conducts ultrasonic inspection for bonding defects.

b) Defects in the sliding surface of the bearing.

Penetration inspection is generally carried out after finishing the multi-layer sliding bearing.

The inspection of combined defects is usually applicable to multilayer sliding bearings composed of steel, cast steel or cast bronze as the backing material, and can also be used for other bearings

The material of the bearing product is combined with the auxiliary inspection of the defect during the processing. Bearing backing materials that cannot be tinned or difficult to tin, such as pearlite

Special cast iron materials, stainless steel or cast aluminum, because there is no bonding layer between the bearing backing and the bearing alloy material, this method cannot be used to test the bonding

defect.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article

Pieces. For undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 18329.1 Ultrasonic non-destructive testing of the bonding strength of multi-layer metal sliding bearings of sliding bearings (GB/T 18329.1-

2001, idtISO 4386-1.1992)

ASTME1417 Standard Practice for Liquid Penetrant Testing (Standard Practice for Liquid Penetrant Testing)

3 Terms and definitions

No terms and definitions are given in this section.

4 Safety precautions

Penetration inspection often uses harmful, flammable and/or volatile substances, so accident prevention, toxic substance disposal and environmental protection should be adopted

And other relevant protective measures. The inspection should be carried out by qualified personnel with penetrant inspection qualifications.

5.1 General

The surface to be inspected should be free of residues to allow penetration of the penetrant. The residual metal burrs or metal shavings caused by machining should be mechanically used

For removal, the attached oil and grease should be removed by chemical methods. The surface to be inspected should be thoroughly dried at a temperature not exceeding 55°C.

The surface roughness of the surface to be inspected should satisfy $Ra \leq 5\mu m$.

5.2 Mechanical pretreatment

Appropriate methods such as brushing and grinding should be used to remove rust. In the pretreatment process, it should be ensured that the defects are not blocked. If necessary, mechanical

Surface etching treatment is recommended after treatment. After the surface etching treatment, the surface to be inspected should be thoroughly rinsed and dried.

5.3 Chemical pretreatment

Suitable chemical cleaning agents (such as degreasing agents, etching or paint removers) should be used to remove surface residues. After the chemical cleaning is completed, all remaining

All substances should be completely removed, such as washing the surface to be inspected with water.

5.4 Drying

After pretreatment, the surface to be inspected should be dried to ensure that there is no moisture or cleaning agent residue on the surface defects.

6 Penetration treatment

6.1 Water-washing or solvent-removing penetrants should be used during the inspection. The temperature of the surface to be inspected should be between 10°C and 50°C.

Note. Penetrants with higher viscosity can improve cleaning safety.

6.2 The penetrant should be applied by immersion, brushing or spraying. The penetration time should be controlled between 10min and 20min. for

For penetrants with higher viscosity, the penetration time should be at least 20min. During the entire penetration time, the surface to be inspected should always remain sufficiently wet.