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Replacing JB/T 6639-2004

Rolling bearings - Rubber seals reinforced with a sheet steel insert - Specifications

滚动轴承　骨架式橡胶密封圈　技术条件

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Foreword

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

This Standard replaces JB/T 6639-2004, *Rolling bearing parts – Skeleton acrylonitrile-buta-diene copolymers seal – Specifications*. Compared with JB/T 6639-2004, the major technical changes are as follows:

-- it changes the name of the standard (see cover and first page; cover and first page of 2004 edition);

-- it changes the applicable scope of the standard (see Clause 1; Clause 1 of 2004 edition);

-- it changes some normative references (see Clause 2; Clause 2 of 2004 edition);

-- it adds the types of seal materials (see 3.1);

-- it changes some names of technical performance indexes of seal materials (see Table 1, Table 1 of 2004 edition);

-- it refines the geometrical tolerances and planeness requirements 1 (see 3.3.2; 3.3.2 of 2004 edition);

-- it refines the appearance quality requirements for rubber seals (see 3.3.3; 3.3.4 of 2004 edition);

-- it changes the provisions on storage period (see 6.3; 3.3.9 of 2004 edition).

This Standard was proposed by China Machinery Industry Federation.

This Standard shall be under the jurisdiction of National Technical Committee 98 on Rolling bearings of Standardization Administration of China (SAC/TC 98).

The drafting organizations of this Standard: Luoyang Bearing Research Institute Co., Ltd., Anhui Kubo Oil Seals Co., Ltd., Zhejiang Xiangyu Seals Co., Ltd., Hangzhou Lixiang Plastics Co., Ltd., Wuxi Huayan Bearing Sealing Parts Co., Ltd., Shanghai Pudong Rubber Seals Co., Ltd., Wanxiang Qianchao Co., Ltd., Wuxi Huayang Rolling Bearing Co., Ltd., Jiangsu Nanfang Bearing Co., Ltd., Changzhou Laili Seals Co., Ltd.

The main drafters of this Standard: Zhang Su'e, Sun Weihua, Lin Huaqiang, Wang Zijun, Xie Yunzhou, You Xiaowei, Hu Wenzhuang, Yang Jianhong, Xi Hongxiang, Yin Xiaowen, Sun Jiawei, Pan Tianrong.

The previous editions of the standard replaced by this Standard are as follows:

Rolling bearings - Rubber seals reinforced with a sheet steel insert - Specifications

1 Scope

This Standard specifies the technical requirements, test methods, inspection rules and marking, packaging, transportation and storage of rubber materials, skeletons and finished products of skeleton type rubber seals for rolling bearings (hereinafter referred to as rubber seals).

This Standard applies to the quality inspection and acceptance of skeleton type rubber seal materials and finished products. This Standard can work as a reference for the inspection and acceptance of skeleton-free rubber seal materials and finished products.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to this document.

GB/T 528-2009, *Rubber, vulcanized or thermoplastic – Determination of tensile stress-strain properties*

GB/T 531.1-2008, *Rubber, vulcanized or thermoplastic – Determination of indentation hardness – Part 1: Durometer method (Shore hardness)*

GB/T 1689-2014, *Rubber vulcanized – Determination of abrasion resistance (Akron machine)*

GB/T 1690-2010, *Rubber, vulcanized or thermoplastic – Determination of the effect of liquids*

GB/T 2361-1992, *Rust preventing oils and greases – Test method of wet heat*

GB/T 2828.1-2012, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

GB/T 3512-2014, *Rubber, vulcanized or thermoplastic – Accelerated ageing and*

The rust preventive greases and oils for the rubber layers of seals and bearings shall be compatible. After test is carried out as specified in Annex B, dimensional change of rubber seals shall not exceed those specified in product drawings.

3.3.6 Rust prevention of rubber seals' skeleton

Rubber seals' skeleton shall be free from rust; the coating of rubber shall be uniform and complete; test is carried out for 72 h using the method specified in 4.3.6; no visible rust points are allowed.

4 Test methods

4.1 Rubber

4.1.1 The hardness of rubber shall be tested using the method specified in GB/T 531.1-2008.

4.1.2 The tensile strength at break and elongation at break of rubber shall be tested using the method specified in GB/T 528-2009; the test pieces shall be test pieces of type I A.

4.1.3 The compression set of rubber shall be tested using the methods specified in GB/T 7759.1-2015 and GB/T 7759.2-2014; the test pieces shall be test pieces of type B.

4.1.4 The brittleness temperature of rubber shall be tested using the method of procedure B specified in GB/T 15256-2014; the test pieces shall be test pieces of type A.

4.1.5 The hot air ageing of rubber shall be tested using the method specified in GB/T 3512-2014.

4.1.6 The liquid resistance test of rubber shall be tested using the method specified in GB/T 1690-2010; the test pieces shall be test pieces of type I.

4.1.7 The abrasion volume of rubber shall be tested using the method specified in GB/T 1689-2014.

4.1.8 The bond strength between rubber and metal shall be tested using the method specified in GB/T 11211-2009; the surface of the standard-size sheet metal used in test in contact with rubber shall be treated using the same process as the skeleton surface treatment.

4.2 Skeleton

The materials of skeleton shall be tested using the methods specified in GB/T 5213-

2008 or GB/T 13237-2013.

4.3 Finished products

4.3.1 Structural forms and dimensions

The structural forms and dimensions of rubber seals shall be tested using a tool microscope, image measurement instrument or special measurement tool.

4.3.2 Geometric tolerance

The geometric tolerances of rubber seals shall be tested using an image measurement instrument or special measurement tool.

4.3.3 Appearance quality

The appearance quality of rubber seals shall be checked by visual inspection or instruments.

4.3.4 Bond degree between rubber and skeleton

The method for testing the bond degree between rubber and skeleton of nitrile butadiene rubber seals shall be as specified in Annex A; the method for testing the performance of other rubber seals shall be as agreed by the manufacturer and the user.

4.3.5 Dimensional stability

The method for testing the dimensional stability of rubber seals in rust preventive greases and oils shall be as specified in Annex B.

4.3.6 Rust protection of rubber seals' skeleton

The rust protection performance of rubber seals' skeleton shall be tested using the method specified in GB/T 2361-1992. Use rubber seals directly as test pieces; only clean them for the purposes of decontamination and degreasing without carrying out other treatment. The method for cleaning is to use tweezers to clamp degreased cotton soaked in organic solvent gasoline and to scrub for two or three times. Do not scratch skeleton or rubber coating during cleaning.

5 Inspection rules

5.1 Rubber

5.1.1 The appearance of rubber shall be checked roll by roll.

5.1.2 Rubber which is produced from the same working shift, the same equipment and

Annex A

(Normative)

Method for testing rubber seals in acetone

A.1 General rules

This test method is to soak rubber seals in acetone for a certain time, and then observe and record whether bubble, wrinkle or delamination occurs on their surface, in order to evaluate the bond degree between rubber and skeleton of rubber seals.

A.2 Apparatus and reagent

A.2.1 Apparatus and reagent

The apparatus and reagents include:

a) lathe;

b) culture dishes or sample weighing bottles;

c) tweezers;

d) P180 coated abrasive;

e) scissors;

f) narrow type sharp knife;

g) clock;

h) rubber seals to be tested.

A.2.2 Reagent

Acetone (analytically pure).

A.3 Preparatory work

A.3.1 Use a pair of scissors to cut the outer lips of rubber seals; use coated abrasive of granularity P180 to polish rubber not trimmed well to expose the outer edge of skeleton. Then use a narrow sharp knife to cut off the inner lips of rubber seals to expose the inner bores of skeleton. During cutting, the knife shall be sharp; cut in the direction from rubber layer to skeleton; do not cut to-and-fro to prevent damage of the bond between rubber layer and skeleton.

Annex B

(Normative)

Method for testing dimensional stability of rubber seals in lubricating greases and rust preventive oils

B.1 General rules

This test method is to measure the dimensional change of rubber seals after soaking in lubricating greases or rust preventive oils for a certain time at constant temperature in order to determine their dimensional stability.

B.2 Apparatus and materials

B.2.1 The apparatus include:

a) reading microscope or tool microscope (with the indicating accuracy not less than 0.01 mm and the measuring range greater than the outer diameter of rubber seals to be tested);

b) electrically heated constant temperature drying oven (with the adjustable temperature range 50°C ~ 200°C and the temperature control accuracy ± 1°C);

c) culture dishes or beakers (whose diameter is 15 mm ~ 25 mm greater than the diameter of rubber seals);

d) narrow scraper (plastic or ox horn piece, 180 mm ~ 200 mm long, 8 mm ~ 15 mm wide, 2 mm ~ 3 mm high);

e) sample holder (triangular bracket or hanger).

B.2.2 The materials include:

a) lubricating greases or rust preventive oils (greases or oils in contact with rubber seals during operation);

b) rubber seals to be tested.

B.3 Test procedures

B.3.1 Place rubber seals in the environment for more than 2 h at room temperature of 25°C ± 2°C; after their dimensions become stable, use a reading microscope or tool microscope to measure the inner diameter and outer diameter twice at the positions perpendicular to each other on rubber seals; take the arithmetical mean value of the

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