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

GB/T 13871.4-2023

Replacing GB/T 13871.4-2007

**Rotary shaft lip-type seals incorporating elastomeric sealing
elements - Part 4: Performance test procedures**

密封元件为弹性体材料的旋转轴唇形密封圈 第4部分：性能试验程序

(English Translation)

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Table of Contents

- Foreword
- Introduction
- 1 Scope
- 2 Normative reference documents
- 3 Terms, definitions and symbols

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document is Part 4 of GB/T 13871 "Rotating shaft lip seals with sealing elements made of elastomer materials": GB/T 13871 the following sections have been published:

- Part 1: Dimensions and tolerances;
- Part 2: Vocabulary;
- Part 3: Storage, handling and installation;
- Part 4: Performance test procedures;
- Part 5: Identification of appearance defects;
- Part 6: Elastomer material specifications:

This document replaces GB/T 13871.4-2007 "Rotating shaft lip seals with sealing elements made of elastomer materials - Part 4: Performance "Test Procedure", compared with GB/T 13871.4-2007, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) GB/T 5719 is replaced with GB/T 13871.2 in terms and definitions (see Chapter 3, Chapter 3 of the:2007 edition);
- b) Added symbols (see 3.2);
- c) Changed the inspection requirements for sealing rings in the pre-test procedure (see 4.1, 4:1 of the:2007 edition);
- d) Changed the performance requirements for sealing ring elastomer materials (see 4.2, 4:2 and Chapter 7 of the:2007 edition);
- e) Added requirements for measuring the radial force of the sealing lip [see 4.3g)];

f) The requirement that "the minimum amount of test liquid is 0.75L" in the additional requirements for test equipment is deleted [see 5.1.2j) of the:2007 version];

g) Delete the requirement "necessary means should be provided to collect and measure the mass of liquid leaking from the sealing ring" in the additional requirements for test equipment:

Seek [see:2007 version 5.1.2m)];

h) The operational requirement that "the direction of rotation should be reversed during each cycle rotation" is deleted (see 5.4 of the:2007 version);

i) Added the requirement that "the sealing lip should not have visually visible defects such as chips, cracks, tears, etc." (see 5.7);

j) The content of "Qualification Judgment" in "Low Temperature Test" has been changed (see 6.7,;2007 version of 6.7):

This document is modified to adopt ISO 6194-4:2009 "Rotating shaft lip seals with sealing elements made of elastomer materials - Part 4: Performance Test Procedures":

Compared with ISO 6194-4:2009, this document has made the following structural adjustments:

---4:2 corresponds to 4:2 and Chapter 7 of ISO 6194-4:2009;

---Chapter 7 corresponds to Chapter 8 of ISO 6194-4:2009:

The technical differences between this document and ISO 6194-4:2009 and their reasons are as follows:

a) ISO 6194-2 is replaced by normatively cited GB/T 13871.2, and ISO 5598 is replaced by GB/T 17446 (see section Chapter 3), to adapt to my country's technical conditions;

b) Replaced ISO 6194-1 (see 3.2) with the normatively cited GB/T 13871.1 to adapt to my country's technical conditions;

c) The inspection requirements for sealing rings in the pre-test procedure have been changed, and the normative reference GB/T 13871.5 has been added (see 4.1, 4:1) of ISO 6194-4:2009 to make the pre-test procedure more complete;

d) Replaced the performance requirements and test methods of sealing ring elastomer materials with the normatively quoted GB/T 13871.6 and deleted them Normatively cited ISO 2781, ISO 48, ISO 815-1, ISO 815-2, ISO 1817, ISO 188, ISO 812 (see 4.2, 4:2 and Chapter 7 of ISO 6194-4:2009) to adapt to my country's technical conditions;

e) The selection of standard shafts and cavities of test equipment has been deleted (see 5.1 and Table 1 of ISO 6194-4:2009) to adapt to my country's technology technical conditions;

f) The requirement that "the minimum amount of test liquid is 0.75L" in the additional requirements for equipment is deleted [see ISO 6194-4:2009 5.1j)], to adapt to my country's technical conditions;

g) Delete the words "Means should be provided to collect and measure the mass of liquid leaking from the sealing ring during the test" in the additional requirements for equipment: Section" requirements [see ISO 6194-4:2009 5.1m)] to adapt to my country's technical conditions;

h) The installation requirements for sealing rings in the test procedures are added, and the normative reference GB/T 13871.3 (see 5.2:2, 6:4:4) is added to Improve the operability of the test;

i) Added requirements for measuring the radial force of the sealing ring and observing whether there is leakage on the sealing lip (see 5.5) to adapt to my country's technology technical conditions;

j) Added the content that "the sealing lip should not have visually visible defects such as gaps, cracks, tears, etc:" (see 5.7) to adapt to my country's technology condition;

k) The content of "qualification determination" in "low temperature test" has been changed (see 6.7, 6:7 of ISO 6194-4:2009) to adapt to my country's technology condition:

The following editorial changes have been made to this document:

---In the description of the size symbols in Figure 1, in accordance with my country's size expression habits, the expression "nominal" is deleted;

---"Dynamic normal temperature test" is changed to "dynamic test", and "dynamic low temperature test" is changed to "low temperature test";

---Deleted Appendix C (Informative) "Typical Examples of Elastic Material Test Reports" of ISO 6194-4:2009:

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

Rotary shaft lip seals are used to seal liquids (such as lubricating oil) in equipment with relatively low pressure differences: Usually the axis rotates and the cavity is stationary:

In some cases, the shaft is stationary and the cavity rotates:

This dynamic sealing is usually achieved by designing an interference fit between the shaft and the elastomeric sealing element:

Similarly, an interference fit between the outer diameter of the rotating shaft lip seal and the

inner diameter of the cavity can tighten the seal and prevent static leakage:

GB/T 13871 "Rotating shaft lip seal ring with sealing element made of elastomer material" stipulates that the sealing element is made of elastomer material:

Shaft lip seal ring consists of 6 parts:

---Part 1: Dimensions and tolerances: The purpose is to design the dimensions of the lip seal ring of a rotating shaft whose sealing element is made of elastomer material:

and acceptance:

---Part 2: Vocabulary: The purpose is to summarize and define the terms and definitions of rotary shaft lip seals with elastomeric sealing elements:

Meaning, easy to understand and communicate:

---Part 3: Storage, handling and installation: The purpose is to standardize the operation of sealing rings during storage, transportation and installation: These operations Care must be taken to avoid damage caused before and during installation that may affect the service life of the seal:

---Part 4: Performance test procedures: The purpose is to verify the actual use of rotating shaft lip seals whose sealing elements are made of elastomer material:

Effect:

---Part 5: Identification of appearance defects: The purpose is to identify the appearance quality and avoid leakage caused by appearance defects:

---Part 6: Elastomer material specifications: The purpose is to select suitable elastomers for rotating shaft lip seals under various working conditions:

Sexual material:

The sealing element is a rotary shaft lip seal ring made of elastomer material Part 4: Performance test procedures WARNING: Personnel using this document should be familiar with regular laboratory operating procedures: This document does not indicate all relevant Safety issues (if any), but note that correct protective measures must be taken when handling hot and cold fluids and equipment: It is the user's responsibility to create Appropriate safety and health procedures and ensuring compliance with national regulatory conditions:

1 Scope

This document specifies the symbols and labeling instructions for rotating shaft lip seals (hereinafter referred to as sealing rings) whose sealing elements are made of elastomer material: