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

GB/T 3452.5-2022

**O-rings for fluid power systems - Part 5: Specification of
elastomeric materials**

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foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules for Standardization Documents" drafting.

This document is Part 5 of GB/T 3452 "O-Rubber Seals for Hydraulic and Pneumatic Applications". GB/T 3452 has issued the following part.

- Part 1. Dimension series and tolerances;
- Part 2. Appearance quality inspection specifications;
- Part 3. Groove dimensions;
- Part 4. Anti-extrusion ring (retaining ring);
- Part 5. Specifications for elastomeric materials.

This document is modified to adopt ISO 3601-5:2015 "O-rings for fluid transmission systems - Part 5. Specifications for industrial elastomer materials".

Compared with ISO 3601-5:2015, this document has made the following structural adjustments.

--- "When selecting the material of the O-ring in 4.1, the working conditions should be considered. Therefore, the user should use the working parameters (such as temperature degree, pressure, etc.) to determine the O-ring material. "Corresponds to the content of 4.4 in ISO 3601-5:2015.

--- The performance and index of the O-ring sample are shown in Appendix C, Table C.1~Table C.6, corresponding to Table 3, Table 5~Table 7, Table 5 in ISO 3601-5:2015

Contents of O-ring samples in Table 9 and Table 10.

The technical differences between this document and ISO 3601-5:2015 and their reasons are as follows.

--- Regarding the normative reference documents, the international standards are replaced by Chinese standards to adapt to the technical conditions of our country and increase operability.

See Appendix A for the comparison between the normative references in this document and ISO 3601-5:2015;

--- Table 1 has been supplemented and optimized, the column of vulcanization system in Table 1 of ISO 3601-5:2015 has been deleted, and the nitrile rubber material and three Yuan ethylene propylene rubber material does not distinguish vulcanization system, two lines are combined into one line; ethylene acrylate rubber material (AEM) and polyester are added

Type polyurethane rubber material (AU), polyether type polyurethane rubber material (EU) (see Table 1), in order to improve the technical level and adapt to my country's technical conditions;

--- Deleted 4.3 and Table 2 in ISO 3601-5:2015 to avoid duplication of content and adapt to the technical conditions of our country;

--- For all materials, the ShoreA method is added to the hardness test carried out using standard specimens, and the normative references are added

GB/T 531.1 (see Table 2~Table 7), to adapt to the technical conditions of our country;

--- For all materials, change the compression set from 336h to 168h (see Table 2~Table 7, Table C.1~Table C.6), and compare the indicators

It should be adjusted to shorten the test cycle and adapt to the technical conditions of our country;

--- For all materials, the hot air aging performance of 72h has increased the index of change rate of tensile strength and change rate of elongation at break (see Table 2~

Table 7, Table C.1~Table C.6), to make the assessment indicators more reasonable and advanced;

--- For all materials, change "Resistance to ISO No. 1 Oil" to "Resistance to No. IRM901 Oil", change "Resistance to No. ISO 3 Oil" to "Resistance to No. IRM903 Oil

Oil" (see Table 2~Table 5, Table 7, Table C.1~Table C.4 and Table C.6), to adapt to the technical conditions of our country and enhance operability;

--- Increase the hardness level of nitrile rubber "80" (see Table 2, Table C.1), so that the hardness level division of materials is more perfect and reasonable, more suitable

According to the technical conditions of our country;

--- Change the hardness level of hydrogenated nitrile rubber from "90" to "85"; its compression set, resistance to IRM901 oil and IRM903

The test temperature of the oil was changed from "125°C" to "150°C" (see Table 3, Table C.2) to adapt to my country's technical conditions and improve technical conditions.

Technical rationality and technical level;

---Deleted the hardness level "75" of fluororubber; the test temperature of its compression set was changed from "175°C" to "200°C" (see Table 4,

Table C.3), in order to adapt to the technical conditions of our country and improve the technical rationality and technical level;

--- The test temperature for compression set of silicone rubber is changed from "175°C" to "200°C" (see Table 5, Table C.4) to adapt to the national standard

Technical conditions, improve technical rationality and technical level;

--- EPDM rubber increases the requirements for brake fluid resistance (see Table 6, Table C.5) to adapt to the technical conditions of our country;

--- Increased the performance requirements of ethylene acrylate rubber material (AEM) (see Table 8, Table C.7) to improve the types of materials and adapt to I

country's technical conditions;

--- Increased the performance requirements of polyester polyurethane rubber materials (AU) and polyether polyurethane materials (EU), and added normative references

GB/T 529 (see Table 9 and Table 10) is used to improve the types of materials and meet the inspection requirements, and adapt to the technical conditions of our country;

---The hardness index of all O-ring samples (see No. 1 in Table C.1~Table C.7), compared with the index of the same hardness level of the same material

The hardness index of the quasi-sample is 5 IRHD lower (see No. 1 in Table 2 to Table 8) to improve technical rationality;

--- Deleted the referenced ISO 3601-1 (see Appendix A) to adapt to the technical conditions of our country;

--- Added "Preparation and Adjustment of Specimen" (see Chapter 5), and added normative references to GB/T 2941 (see 5.1) to adapt to I

country's technical conditions;

--- Added "inspection rules" (see Chapter 6) to adapt to the technical conditions of our country;

--- Added "marking, packaging, transportation and storage" (see Chapter 7) to adapt to the technical conditions of our country.

The following editorial changes have also been made to this document.

--- In order to coordinate with the current standard, the name of the standard is changed to "O-ring rubber seals for hydraulic and pneumatic use - Part 5.Specifications for elastomer materials

Fan";

--- Added Appendix B (informative) "Using temperature and applicable liquid of elastomeric materials";

--- Added Appendix D (informative) "Indicator differences between this document and ISO 3601-5.2015".

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

In a hydropneumatic system, power is transmitted and controlled by the pressure of a fluid (liquid or gas) in a closed path. O shape

Circles are an integral part of the system. GB/T 3452 "O-shaped rubber seal ring for hydraulic and pneumatic" specifies the

The technical requirements of O-rings are composed of 5 parts.

--- Part 1.Dimension series and tolerances. The purpose is for the size design or acceptance of O-ring rubber seals.

--- Part 2.Appearance quality inspection specifications. The purpose is to identify the appearance quality of the O-ring, for quality control or acceptance, to avoid Avoid leakage due to appearance defects.

--- Part 3.Groove dimensions. The purpose is to match the size of the O-shaped rubber sealing ring to achieve a good sealing effect.

--- Part 4.Anti-extrusion ring (retaining ring). The purpose is to use anti-extrusion rings in conjunction with O-ring grooves under high pressure conditions to prevent

The o-ring is squeezed between metal parts (for example, between the cylinder bore and the piston or between the piston rod and the groove).

--- Part 5.Specifications for elastomeric materials. The purpose is to evaluate the suitability of O-ring elastomeric material (rubber) for production or acceptance.