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(JAPIA/JSA)

**Rotary shaft lip type seals—
Part 4 : Performance test
procedures**

ICS 21.140; 23.100.60; 83.140.50

Reference number : JIS B 2402-4 : 2002 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from the Japan Auto Parts Industries Association (JAPIA)/the Japanese Standards Association (JSA), with a draft of Industrial Standard based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

By this establishment, **JIS B 2402 : 1996 Rotary shaft lip type seals** is withdrawn and replaced with **JIS B 2402-1** to **JIS B 2402-5**.

JIS B 2402 group consists of the following 5 parts with the general title *Rotary shaft lip type seals*:

- Part 1 : Nominal dimensions and tolerances*
- Part 2 : Vocabulary*
- Part 3 : Storage, handling and installation*
- Part 4 : Performance test procedures*
- Part 5 : Identification of visual imperfections*

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Rotary shaft lip type seals— Part 4 : Performance test procedures

Introduction This part of **JIS B 2402** has been prepared based on the second edition of **ISO 6194-4 Rotary shaft lip type seals—Part 4 : Performance test procedures** published in 1999 without modifying the corresponding parts (performance test procedures) but matters not specified in the original International Standard are added which are sidelined or underlined with dots.

1 Scope This part of **JIS B 2402** specifies test requirements for rotary shaft lip type seals. The tests may be used for qualification purposes. Materials quality control, dynamic testing and supplementary low temperature testing requirements are also covered.

Remarks : The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

ISO 6194-4 : 1999 *Rotary shaft lip type seals—Part 4 : Performance test procedures* (MOD)

2 Normative references The following standards contain provisions which, through reference in this part of **JIS B 2402**, constitute provisions of this part of **JIS B 2402**. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 2402-1 *Rotary shaft lip type seals—Part 1 : Nominal dimensions and tolerances*

Remarks : **ISO 6194-1** : 1982 *Rotary shaft lip type seals—Part 1 : Nominal dimensions and tolerances* is equivalent to the said standard.

JIS B 2402-2 *Rotary shaft lip type seals—Part 2 : Vocabulary*

Remarks : **ISO 6194-2** : 1991 *Rotary shaft lip type seals—Part 2 : Vocabulary* is identical with the said standard.

JIS K 2215 *Internal combustion engine oils*

JIS K 6253 *Hardness testing methods for rubber, vulcanized or thermoplastic*

Remarks : **ISO 7619** : 1986 *Rubber—Determination of indentation hardness by means of pocket hardness meters* is equivalent to the said standard.

JIS K 6257 *Accelerated aging test methods for vulcanized rubber*

Remarks : **ISO 188** : 1982 *Rubber, vulcanized—Accelerated ageing or heat-resistance tests* is equivalent to the said standard.

JIS K 6258 *Testing methods of the effect of liquids for vulcanized rubber*

Remarks : **ISO 1817** : 1985 *Rubber, vulcanized—Determination of the effect of liquids* is equivalent to the said standard.

JIS K 6261 *Low temperature testing methods for rubber, vulcanized or thermoplastic*

Remarks : **ISO 812** : 1991 *Rubber, vulcanized—Determination of low-temperature brittleness*, **ISO 815** : 1991 *Rubber, vulcanized or thermoplastic—Determination of compression set at ambient, elevated or low temperatures*, **ISO 1432** : 1988 *Rubber, vulcanized or thermoplastic—Determination of low temperature stiffening (Gehman test)* and **ISO 2921** : 1982 *Rubber, vulcanized—Determination of low-temperature characteristics—Temperature-retraction procedure (TR test)* are equivalent to the said standard.

JIS K 6262 *Permanent set testing methods for rubber, vulcanized or thermoplastic*

Remarks : **ISO 815** : 1991 *Rubber, vulcanized or thermoplastic—Determination of compression set at ambient, elevated or low temperature* and **ISO/DIS 2285** : 1996 *Rubber, vulcanized or thermoplastic—Determination of tension set at normal and high temperatures* are equivalent to the said standard.

JIS K 6268 *Rubber, vulcanized—Determination of density*

Remarks : **ISO 2781** : 1988 *Rubber, vulcanized—Determination of density* is identical with the said standard.

ASTM D 471 *Standard Test Method for Rubber Property-Effect of Liquids*

3 Definitions For the purposes of this part of **JIS B 2402**, the terms and definitions given in **JIS B 2402-2** and the following definition apply.

3.1 batch identifiable and traceable consignment of rubber compound of definite composition and manufactured in a single production operation

4 Pre-test procedure

4.1 Inspect all seals submitted for testing for conformity to a relevant drawing or detailed specification declared by the seal manufacturer.

4.2 For seals with an elastomeric component, ensure that the seal manufacturer has stated the material designation batch number from which the seals have been made, together with the nominal density, nominal hardness, maximum compression set value and maximum mass change after immersion in the test fluid.

Where the seal is required for the low temperature stiffness test, ensure that the seal manufacturer has also stated the maximum modulus after test at the selected test temperature.

Ensure that the batch of elastomer has been tested in accordance with clause 7.

4.3 To facilitate accurate analysis of the test results, determine the following data concerning the physical characteristics of the seal and test apparatus before testing:

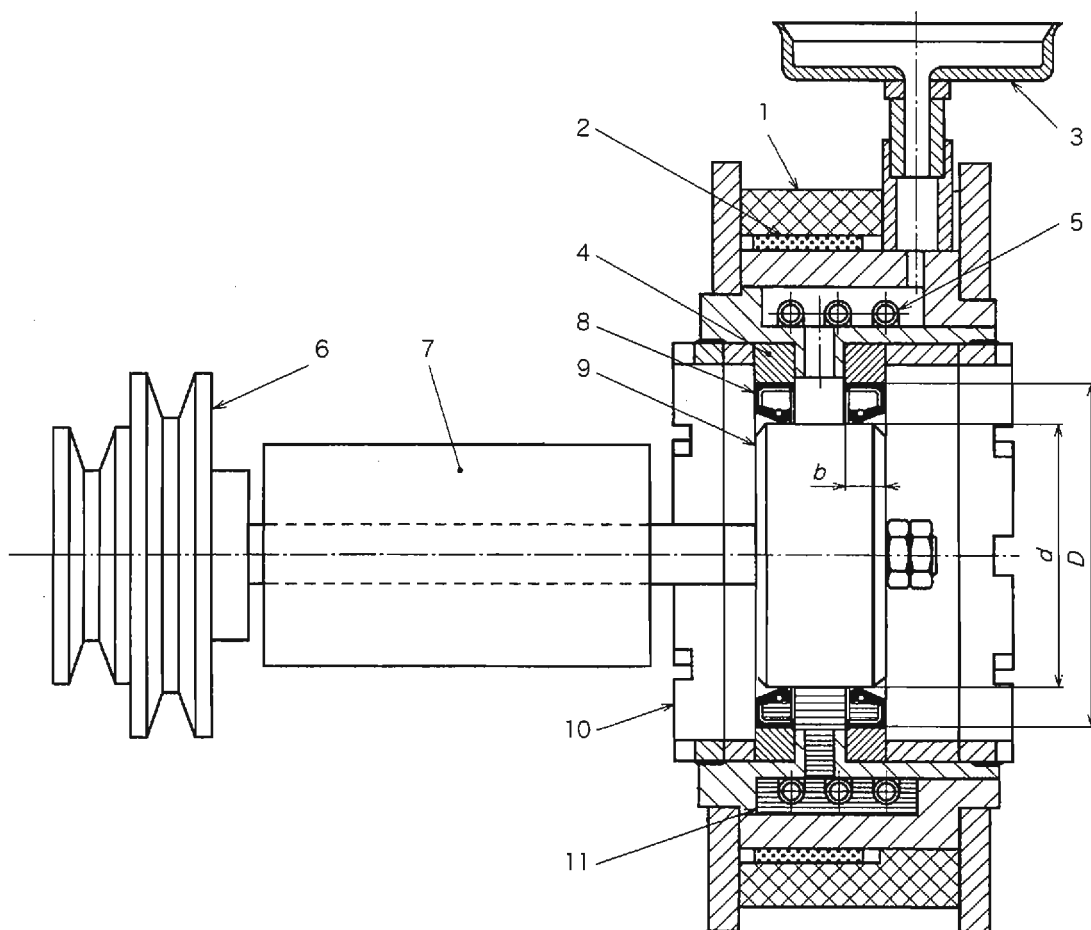
- a) lip diameter (with spring);
- b) lip diameter (without spring, measured not less than 24 h after removal of spring);

- c) outer case mean diameter and out-of-roundness;
- d) shaft diameter, material hardness and surface roughness;
- e) housing diameter, material and surface roughness;
- f) minor lip diameter, where applicable (with and without primary lip spring fitted).

4.4 Ensure that the specified shaft eccentricity and housing off-set of the test apparatus have been incorporated.

5 Dynamic test

5.1 Test apparatus The test apparatus shall be similar to the typical example shown in Figure 1 and shall consist of a suitable housing for retaining the test fluid and for positioning the test seals, as well as a rotating member having a spindle mounted horizontally on suitable bearings. The design of the housing for the seal shall be in accordance with the dimensions specified in **JIS B 2402-1**.



Key

- | | |
|--------------------------|---------------------|
| 1 Insulation | 7 Test head support |
| 2 Heater band | 8 Test seal |
| 3 Filler tray | 9 Test shaft |
| 4 Seal housing | 10 Locking ring |
| 5 Cooling coils | 11 Test fluid |
| 6 Drive from prime mover | |

Figure 1 Typical example of dynamic test apparatus

Where it is not practicable to provide a test apparatus with the particular shaft and housing size relevant to the application, the test apparatus shall be selected from the standard sizes listed in Table 1. The size selected shall be that nearest to the application size.