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Industrial Standard of the People's Republic of China

JC/T 2053-2020

Replace JC/T 2053-2011

Non-metallic sealing packing

非金属密封填料

*(English Translation)*

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## Foreword

SAC/TC 406 is in charge of this English translation. In case of any doubt about the contents of the English translation, the Chinese original shall be considered authoritative.

This document is drafted in accordance with the rules given in the GB/T 1.1—2020 *Directives for standardization—Part 1: Rules for the structure and drafting of standardizing documents*.

This document replaces JC/T 2053-2011 (Non-metallic sealing packing). In addition to the structural adjustment and the editorial changes, the following technical deviations have been made with respect to the JC/T 2053-2011 (Non-metallic sealing packing):

a) Modify the “The mark of the packing consists of the product name, specification (side length of cross section  $\times$  side length) and this standard number” into “marking of the packing is composed of product name, standard number and specification (side length of cross section  $\times$  side length)” of this standard”. Modifications have also been made with respect to examples in 4.2.1 and 4.4.4. (see 4.2.1 and 4.4.4 of this edition);

b) Modify the “Size classification in size deviation of packings” in Table 2. Combine the “16~19” and “20~25” and change it to “15</math>25”. Also, the size deviation of packings has been re-defined (See table 2 of this document and table 2 of the 2011 edition);

c) Modify the “basic Dimensions” into “Basic Dimensions /mm of inner diameter” (See table 5 of this standard and table 4 of the 2011 edition).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing body of this document shall not be held responsible for identifying any or all such patent rights.

This document is proposed by China Building Materials Federation.

This document was prepared by SAC/TC 406 (National Technical Committee 406 on Nonmetallic Mineral Products of Standardization Administration of China).

The previous version replaced by this document is:

—JC/T 2053-2011.

# Non-metallic sealing packing

## 1 Scope

This document specifies the classification and marking, requirements, test methods, inspection rules, signing, packaging, transportation and storage of non-metallic sealing packing.

This document is applicable to sealing packings and filling rings made of non-metallic materials that do not contain asbestos. Pure graphite packing rings can also use this standard for reference.

## 2 Normative references

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

GB/T 23262 *Test method for non-metallic sealing packings*

JB/T 6370 *Test method for physical and mechanical properties of flexible graphite packing ring*

## 3 Terms and definitions

There are no terms and definitions to be defined in this document.

## 4 Classification and marking

### 4.1 Classification

Non-metallic sealing packing can be divided into two categories: braided packing (hereinafter referred to as packing) and molded braided packing ring (hereinafter referred to as packing ring).

According to the working condition in applications, packings can be divided into four types: ordinary packings, high temperature resistant packings, wear resistant packings and corrosion resistant packings. Other types of packings can be agreed upon by both the supplier and the buyer. The working condition characteristics, applicable media and typical materials recommended by various packings are shown in Table 1.

Table 1 Recommended working condition characteristics, applicable media and typical materials for all kinds of packings

Category name	Working condition characteristics	Applicable medium	Typical material
Common packing	pH: 2~12; temperature: 200 °C Pressure (rotation): < 5 MPa;	Solvent, weak acid and weak base.	Cotton, hemp, chemical fiber or combination with impregnating agents and lubricants.
High temperature resistant packing	pH: 0~14; Temperature: 300 °C~800 °C Pressure: <10 MPa;	Medium strength acid and base, hot oil, solvent, steam, crude oil (including product oil).	One or more combinations of flexible graphite, carbon fiber, alloy wire, special lubricant; elastomer glass fiber, ceramic fiber.
Wear resistant packing	pH: 2~12; Temperature: 260 °C Pressure (rotation): < 8 MPa;	Grinding occasion, oil-bearing medium, particle-containing medium.	Phenolic, aramid, carbon fiber, or combination with impregnating agent and lubricant.
Corrosion resistant packing	pH: 0~14; Temperature: 260 °C Pressure (rotation): 5 MPa;	All kinds of corrosion media: acid except 60 °C fuming sulfuric acid, nitric acid, salt formed by strong acid and strong base. Alcohols, phenols, ethers, aldehydes, ketones, quinones.	PTFE and PTFE filled (graphite) fiber, flexible graphite or combination of lubricating impregnating agent.
Note: temperature mentioned here refers to the temperature of the part where the packing is used.			

#### 4.2 Marking

4.2.1 The mark of the packing is composed of the product name, standard number from this standard and specification (side length of cross section × side length).

Example: Aramid impregnated polytetrafluoroethylene oil braided packings, the specification is 10 mm × 10 mm.

Marked as: Aramid impregnated tetrafluoro oil packing, JC/T 2053-2020-10×10.

4.2.2 The mark of the packing ring should consist of the product name, the number of this standard, and the product specification (inner diameter × outer diameter

× height).

Example: Aramid impregnated polytetrafluoroethylene oil braided packing ring, the specification is  $\phi 189 \text{ mm} \times \phi 228 \text{ mm} \times 19 \text{ mm}$ .

Marked as: Aramid impregnated tetrafluoroooly packing ring, JC/T 2053-2020- $\phi 189 \times \phi 228 \times 19$ .

## 5 Requirements

### 5.1 Composition of packings

The composition materials of all kinds of packings shall comply with the provisions of the relevant standards.

### 5.2 Allowable size deviation of packings

The allowable size deviation of the packing shall be in accordance with the provisions of Table 2.

Table 2 Allowable size deviation of packings

Specification (side length of section l) / mm	$l < 5$	$5 \leq l \leq 15$	$15 < l \leq 25$	$l > 25$
Allowable deviation / mm	$\pm 0.4$	$\pm 0.8$	$\pm 1.2$	$\pm 1.5$
*The two sides adjacent to each other are not allowed to have the same positive or negative tolerances.				

### 5.3 Bulk density of packings

The bulk density of packings shall meet the requirements of Table 3 or the requirements of the demand from customer.

Table 3 Bulk density of packings

Name	Flexible graphite	PTFE class	Aramid and phenolic compounds	Ceramic fiber and expanded glass fiber	Carbon fiber	Short fiber	Cotton and hemp
Density/ ( $\text{g}/\text{cm}^3$ )	$\geq 1.1$	$\geq 1.2$	$\geq 1.2$	$\geq 0.6$	$\geq 1.1$	$\geq 1.2$	$\geq 0.9$

5.4 Characteristic index of packing

The characteristic index of the packing shall conform to the provisions of Table 4. Other properties shall comply with the provisions of the corresponding standards.

Table 4 Characteristic index of packing

Category name	High temperature resistant packing		Wear resistant packing		Corrosion resistant packing	
	345 °C/1h	450 °C/1h	Friction coefficient	Wear loss	Acid loss (5% $H_2SO_4$ )	Alkali loss (25%NaOH)
Items	Loss of temperature resistance	Loss of temperature resistance				
Index value	≤6%	≤17%	≤0.15	≤0.1g	≤3%	≤3%

5.5 Appearance quality of packings

The appearance quality of the packings should be smooth. When impregnated with polytetrafluoroethylene emulsion or other lubricants, the impregnant should be evenly distributed and should not fall off. There shall be no more than one exposed thread, jumper, missing flower and edge within 10 m.

5.6 Allowable size deviation of packing ring

The allowable size deviation of the packing ring shall meet the requirements of Table 5 or the requirements of the customer.

Table 5 Allowable size deviation of packing ring

Basic size of inner diameter /mm						Height
	<6	≥6, <30	≥30, <120	≥120, <400	≥400, <1000	
Inner diameter/mm	+0.3	+0.5	+0.8	+1.2	+2.0	±15%
Outside diameter/mm	-0.3	-0.5	-0.8	-1.2	-2.0	

5.7 Bulk density of packing ring

The packing ring shall be pressed using a qualified packing. Its density is generally not less than 1.4 times of the packing, or as specified by the customer.

## 5.8 Appearance quality of packing ring

The packing ring is generally a structure of opening, if double openings are required, the requirement should be put forward by the customer. The packing ring surface appearance quality should be smooth, impregnated with polytetrafluoroethylene emulsion or other lubricants should be evenly distributed and no fall off, no obvious impurities and no exposed thread head. The interface should be tightly joint together and not loose.

## 6 Test methods

### 6.1 Test of packings

#### 6.1.1 Specifications and dimensions

The Vernier caliper with an accuracy of 0.02 mm shall be used. Measurement should be done from two directions perpendicular to each other (accurate to 0.1 mm). Take any point of the braided packing as the starting point. Measure once every 1 m, and take the arithmetic mean value of three measurements as the measurement result.

#### 6.1.2 Bulk density, acid loss, alkali loss, temperature resistance loss, friction coefficient and wear loss

Measure according to the method specified in the GB/T 23262.

#### 6.1.3 Appearance quality

The appearance quality is inspected visually.

### 6.2 Test of packing ring

#### 6.2.1 Specifications and dimensions

Use Vernier calipers with an accuracy of 0.02 mm (accurate to 0.1 mm). When measuring the inner and outer diameters, the arithmetic average values of three equal arcs are taken as the measurement results; When measuring the height, equal arc measurement points should be taken along the circumferential direction. Take the arithmetic mean values of the measurement values as the reported results.

#### 6.2.2 Bulk density

Measure in accordance with the method specified in the JB/T 6370.

#### 6.2.3 Appearance quality

The appearance quality is inspected visually.

## 7 Inspection rules

### 7.1 Inspection classification

#### 7.1.1 Factory inspection

The factory inspection items of packing are 5.2, 5.3 and 5.5, and the factory inspection items of packing rings are 5.6, 5.7 and 5.8.

#### 7.1.2 Routine inspection

Routine inspection is for all items specified in Chapter 5. Routine inspection should be carried out under any of the following circumstances;

- a) New product put into production or identification of product stereotype;
- b) During normal production, inspection should be conducted once a year;
- c) Significant changes have taken place in raw materials, production processes and apparatus, which may affect the quality of products;
- d) Production resumes after over 3 months suspension;
- e) The results of factory inspection are significantly different from the results of previous routine inspection.

### 7.2 Batching

100 kg packings made of the same material and specification is considered as a batch. A single batch less than 100 kg is also considered as a batch. The packing ring of 500 of the same material and the same specification is a batch, A single batch less than 500 pieces is also considered as a batch.

### 7.3 Sampling

The sampling method of packing and packing ring is randomly selected in a warehouse or production site. Samples with sufficient quantity for testing should be taken when sampling.

### 7.4 Judgment regulations

When all the inspection items meet the requirements of this standard, the batch of



products shall be judged as qualified.

If one or more than one tested items not meeting the requirements of this standard, take double numbers of samples for re-inspection of the non-conformance items. If all the re-inspection results meet the requirements of this standard, the batch of products shall still be judged as qualified; otherwise, the batch of products shall be determined as disqualified.

## 8 Signing, packaging, transport and storage

### 8.1 Signing

The packing boxes of braided packings and packing rings should be signed:

- a) Product name;
- b) Name or trademark of manufacturing organization;
- c) Product model or trademark;
- d) Gross weight, net weight;
- e) Manufacturing date or production batch number.

### 8.2 packaging

8.2.1 Braided packings and packing rings shall be packaged to ensure that they will not be damaged or lost during storage and transportation.

8.2.2 The shipping list of the packing product should be attached to the packing box, the marking should include with:

- a) Product name;
- b) Name or trademark of manufacturing organization;
- c) Product model or mark;
- d) Product quantity;
- e) Manufacturing date or production batch number.

8.2.3 The product certificate shall be attached to the packing box, which shall be marked with:

- a) Manufacturing date or production batch number;
- b) Product model or mark;
- c) This standard number;
- d) Inspection date;
- e) Inspection result or conclusion;
- f) Name or code name of the inspector.

### 8.3 Transport and storage

8.3.1 Packing and packing rings should be protected from rain or moisture during transportation.

8.3.2 Packing and their rings should be stored in a clean and dry warehouse. Baking (high temperature), extreme sun exposure, dampness and rain are strictly prohibited.