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JC/T 2052-2020

Replace JC/T 2052-2011

Compressed non-asbestos fibre gasket
materials

辊压法无石棉纤维垫片材料

(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 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 standardizing documents*).

This document replaces the JC/T 2052-2011 (*Compressed non-asbestos fibre gasket materials*) in whole, the following technical deviations have been made with respect to the JC/T 2052-2011 (*Compressed non-asbestos fibre gasket materials*):

- a) Add the GB/T 540-2008 (*Test methods for oil-resisting compressed asbestos fibre jointing*) and the GB 1787 (*Aviation piston engine fuels*) in normative references (see Chapter 2 of this document);
- b) Re-edit the contents about classification and marking in Chapter 4, add the grade mark. The classification is based on the pressure and the maximum service temperature of the medium during application that the product can bear (see Table 1 of this document);
- c) Redefine the physical and mechanical property requirement of products according to the classification of grade mark in the requirements of Chapter 5 (see Table 3, Table 4 of this document, Table 3, Table 4 of 2011 edition);
- d) Add the contents of the density determination in Chapter 6.5 and add the density index in Table 3, Table 4. In addition, specify “The determination of density shall be agreed upon between the supplier and the customer. Density deviations should be within ± 0.1 of the nominal value” (see Chapter 6.5, Table 3, Table 4 of this document, Table 3, Table 4 of 2011 edition);
- e) Delete the contents about the determination of ageing coefficient (see Chapter 5.6 of 2011 edition);
- f) Add the contents about oil sealability test in Chapter 6.12 (see Chapter 6.12 of this edition).

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This document was 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 2052-2011.

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Compressed non-asbestos fibre gasket materials

1 Scope

This document specifies classification and marking, requirements, test methods, inspection rules, marking, packaging, transport and storage of compressed non-asbestos fibre gasket materials (Hereinafter referred to as "gasket materials").

This document is applicable to the sheet materials used for making sealing gaskets. The said material is comprised of non-asbestos fiber as main reinforcing materials, elastomer as binder adhesive, and auxiliary inorganic fillers as reinforcing materials. Gasket materials are made by calendering-compression process to form a sheet materials. Sealing gaskets made with this kind of sheet materials can also use this document as 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 191 *Packaging--Pictorial markings for handling of goods*

GB/T 540 *Test methods for oil-resisting compressed asbestos fibre jointing*

GB 1787 *Aviation piston engine fuels*

GB/T 20671.1 *Classification system and test methods for nonmetallic gasket materials - Part 1: Standard classification system for nonmetallic gasket materials*

GB/T 20671.2-2006 *Classification system and test methods for nonmetallic gasket materials - Part 2: Standard test method for compressibility and recovery of gasket materials*

GB/T 20671.3 *Classification system and test methods for nonmetallic gasket materials - Part 3: Standard test method for fluid resistance of gasket materials*

GB/T 20671.4-2006 *Classification system and test methods for nonmetallic gasket materials - Part 4: Standard test method for sealability of gasket materials*

GB/T 20671.5-2006 *Classification system and test methods for nonmetallic gasket materials – Part 5: Standard test method for creep relaxation of gasket materials*

GB/T 20671.7-2006 *Classification system and test methods for nonmetallic gasket materials – Part 7: Standard test methods for tension testing of nonmetallic gasket materials*

GB/T 20671.8 *Classification system and test methods for nonmetallic gasket materials – Part 8: Standard test method for flexibility of non-metallic gasket materials*

GB/T 22308 *Standard test method for density of a sheet gasket material*

GB/T 23263 *Determination of asbestos in products*

3 Terms and definitions

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

4 Classification and marking

4.1 Classification

Gasket materials can be divided into ordinary non-asbestos fiber gasket materials (hereinafter referred to as ordinary sheet, code: GPT) and oil-resistant non-asbestos fiber gasket materials (hereinafter referred to as oil-resistant sheet, code: GNY). The classification of ordinary sheet and oil-resistant sheet is shown in Table 1. If there are other requirements, they shall be agreed by both the supplier and the customer. Other requirements, if existed, shall be agreed upon between the supplier and the customer.

Table 1 Grade mark and recommended application range of compressed non-asbestos fibre gasket materials

Type	Grade mark	Recommended application range
GPT	GPT-A	Service temperature below 250 °C
	GPT-B	Service temperature below 200 °C
	GPT-C	Service temperature below 150 °C
GNY	GNY-A	Oil medium with service temperature below 250 °C
	GNY-B	Oil medium with service temperature below 200 °C
	GNY-C	Oil medium with service temperature below 150 °C

Note: If the actual service temperature does not meet the requirements of the standard, it may be related to the pressure and medium of the applicable working conditions.

4.2 Marking

In this document, the product grade mark corresponding to the codes specified in the GB/T 20671.1 is given in Appendix A. Gasket materials products can be marked with any of the following 2 methods below:

a) Marked by the type and grade mark of the product, examples:

Example 1: Ordinary sheet gasket material products meeting the requirements of this document. Grade mark is GPT-B, product marking is:

GPTA-JC/T 2052-2020

Example 2: Oil resistant sheet gasket material products meeting the requirements of this document. Grade mark is GNY-B, Product marking is:

GNYP-JC/T 2052-2020

b) Marked in accordance with the GB/T 20671.1, examples:

Example 1: Ordinary sheet (GPT-B) gasket material products that meet the requirements of this document. Marking:

GB/T 20671 (F719000—A9B6L000M5TZ)

Example 2: Oil-resistant sheet (GNY-B) gasket material products that meet the requirements of this document. Marking is:

GB/T 20671 (F719130—A9B9E33L000M5TZ)

5 Requirements

5.1 Materials requirements

5.1.1 The gasket materials with a thickness of less than 3.0 mm should be a one-time molded product, and the internal structure should be homogeneous and uniform.

5.1.2 The gasket materials must not contain any asbestos.

5.1.3 When required by the customer, the gasket materials can be reinforced with wire mesh. The materials, mesh number and wire diameter of the wire mesh shall meet the customer's requirements. And the nitrogen leakage rate shall be agreed upon between the supplier and the customer.

5.2 Visual quality of appearance

The surface of gasket materials shall be smooth and even. It shall not have any defects that may affect the application. Defects such as cracks, bubbles, delamination, agglomeration, foreign impurities and so on, should be avoided. Whether to add coating on the surface shall be agreed upon between the supplier and the customer.

5.3 Dimension deviation

5.3.1 The dimension in length and width of gasket materials shall be agreed upon between the supplier and the customer. The dimension deviation should be within 0 mm~15 mm. Any other special requirements from the customer shall be agreed upon between the supplier and the customer.

5.3.2 The thickness deviation shall comply with the requirements given in Table 2. Any other special requirements of the customer shall be agreed upon between the supplier and the customer.

Table 2 The permitting thickness deviation of gasket materials

Nominal thickness (mm)	Allowable deviation (mm)	Thickness variation of the same sheet of materials (mm)
≤0.41	+0.13 -0.05	≤0.08
>0.41~1.57 (inclusive)	±0.13	≤0.10
>1.57~3.00 (inclusive)	±0.20	≤0.20
>3.00	±10% of nominal thickness	≤0.30

5.4 Physical and mechanical properties

The physical and mechanical properties of GPT shall comply with the requirements given in Table 3. The physical and mechanical properties of GNY shall comply with the requirements given in Table 4. Other performance indicators shall be agreed upon between the supplier and the customer.

Table 3 The physical and mechanical properties of GPT

Items	Indicators		
	GPT-A	GPT-B	GPT-C
Density/ (g/cm ³)	The density shall be agreed upon between the supplier and the customer, and allowable deviation should be within the nominal value ±0.1		
Tensile strength/MPa	≥12	≥9	≥7
Compressibility/%	5~15	5~20	
Recovery/%	≥50	≥40	
Flexibility at room temperature	No cracks		
Nitrogen leakage rate/[mL/(h·mm)]	≤40		
Creep relaxation rate/%	≤40		

For gasket materials with a thickness greater than 3.0 mm, no tensile strength test shall be performed.
For wire mesh reinforced gasket materials, no tensile strength shall be performed.

Table 4 The physical and mechanical properties of GNY

Items		Indicators			
		GNY-A	GNY-B	GNY-C	
Density/ (g/cm ³)		The density shall be agreed upon between the supplier and the customer, and allowable deviation should be within the nominal value ± 0.1			
Tensile strength/MPa		≥ 12	≥ 10	≥ 6	
Compressibility/%		7~17			
Recovery/%		≥ 50	≥ 45	≥ 40	
Flexibility at room temperature		No cracks			
Nitrogen leakage rate/ [mL/ (h · mm)]		≤ 40			
Creep relaxation rate/%		≤ 25	≤ 35	--	
Fluid resistance	Immersion IRM 903, 149 °C ± 2 °C, 5 h	Tensile strength change rate /%	≥ 30	≥ 36	≥ 45
		Thickening rate/%	≤ 15		
		Weight increase/%	≤ 20		
	Immersion ASTM fuel B, 21 °C ~ 30 °C, 5 h	Thickening rate/%	≤ 15		
		Weight increase/%	≤ 20		
Sealing performance of oil at room temperature		Medium pressure/MPa	15	10	8
		Sealing requirements	No leakage within 30 minutes		
For gasket materials with a thickness greater than 3.0 mm, no tensile strength test shall be performed. Wire mesh reinforced gasket materials, no tensile strength shall be performed.					

6 Test Methods

6.1 Conditioning

Gasket materials subjected to any physical and mechanical tests must be first conditioned at 100 °C ± 2 °C in an oven for an hour. After the conditioning, specimens must be cooled to 21 °C ~ 30 °C in a desiccator containing silicagel self indicator.

6.2 Detection of asbestos contents

Asbestos detection shall comply with the requirements given in the GB/T 23263.

6.3 Appearance and quality inspection

Appearance and quality inspection: Done by visual inspection.

6.4 Test of product dimension

6.4.1 The length and width are measured by ruler or measuring tape with a division value of 1 mm.

6.4.2 The thickness measurement is carried out in accordance with test method for type 7 materials given in the GB/T 20671.1. Measure 3 points from both sides and the middle of the sheet product (measuring point should be 10 mm~20 mm apart and away from the edge). Take the arithmetical mean of the 6 points thickness parallel measurement results, then get the measurement results. The difference between the maximum and minimum of the 6 measuring points from the same sheet of materials is taken as the report value of thickness difference.

6.5 Density

Density shall comply with the requirements given in the GB/T 22308.

6.6 Tensile strength (done with across machine direction)

Tensile strength shall comply with the requirements given in the method A of the GB/T 20671.7.

6.7 Compressibility and recovery

Compressibility and recovery shall comply with the requirements given in the procedure J of the GB/T 20671.2.

6.8 Creep relaxation rate

Creep relaxation rate measurement shall comply with the requirements given in the method B of the GB/T 20671.5-2006. The nominal thickness of the sample shall be 1.5 mm.

6.9 Flexibility at room temperature

Flexibility at room temperature shall comply with the requirements given in the GB/T 20671.8. The test temperature is 21 °C~30 °C, and the diameter of the test rod is 12 times the nominal thickness. Both machine direction and cross-machine direction of the sheet shall be tested.

6.10 Nitrogen leakage rate

Nitrogen leakage rate test shall comply with the requirements given in the method B of the GB/T 20671.4-2006, gas leakage rate test method. The test sample is cut in a ring shape with an inner diameter of $32.3\text{ mm}\pm 0.1\text{ mm}$ and an outer diameter of $44.3\text{ mm}\pm 0.1\text{ mm}$, and the inner and outer diameters are concentric. The thickness of the sample is the actual thickness of the product. The thickness measurement is carried out in accordance with test method for type 7 materials given in the GB/T 20671.1. Measure the thickness of the product at the middle position of the equal distance in the circumferential direction. Take the arithmetical mean of the 3 points thickness parallel measurement results, then get the measurement results. The surfaces of the upper and lower flanges in contact with the sample should be parallel to each other, flat and smooth, and the roughness should not be greater than $Ra\ 3.2\ \mu\text{m}$. The flange compression force is $20\text{ MPa}\pm 1\text{ MPa}$, the test medium is nitrogen with a purity of 99% or more, and the medium pressure is $0.98\text{ MPa}\pm 0.02\text{ MPa}$.

6.11 Fluid resistance

The fluid resistance is carried out in accordance with the test method for type 7 materials given in the GB/T 20671.3.

The tensile strength change rate of immersion IRM903 oil is expressed as the percentage of the difference between the unimpregnated tensile strength and the tensile strength after impregnation divided by the unimpregnated tensile strength.

6.12 Sealing performance of oil at room temperature

The sealing performance of oil at room temperature shall comply with the requirements given in the GB/T 540. The medium is RH - 75 aviation gasoline that meets the requirements of the GB 1787. The medium pressure of each grade mark shall comply with the requirements given in Table 4.

7 Inspection rules

7.1 Inspection classification

7.1.1 Factory inspection

The factory inspection items of the gasket materials: appearance and quality, size deviation, density, tensile strength (across machine direction), compressibility and recovery, flexibility at room temperature, and fluid resistance.

7.1.2 Routine inspection

Routine inspection items include all requirements of Chapter 5. Routine inspection shall be performed in case any of the following situations occurs:

- a) The product is formally introduced and an inspection should be performed;

- b) Once a year for routine production;
- c) When significant changes such as raw materials or production processes changes that may affect the properties of products;
- d) The results of factory inspection are significantly different from the results of previous routine inspection;
- e) Production resumes after over 6 months suspension.

7.2 Batching

For the gasket materials of the same thickness produced with the same raw materials and under the same production process with the same production conditions, 500 sheets or less of such products are considered as a batch.

7.3 Sampling

Random sampling method is adopted for the appearance and quality inspection of the gasket materials. Sample quantity for different batches quantity of materials, and criteria for qualifying batches are given in Table 5.

Table 5 Sampling table of appearance inspection of gasket materials

The unit is sheet

Batch	Sample quantity	Qualify number	Unqualify number
2~8	2	0	1
9~15	3	0	1
16~25	5	1	2
26~50	8	1	2
51~90	13	2	3
91~150	20	3	4
151~280	32	5	6
281~500	50	7	8

Three samples are randomly selected from the samples that have passed the appearance and quality inspections as samples for other performance inspections of gasket materials (select more samples when the length and width is smaller or lack of samples), and prepare test items for each sample for each one.

7.4 Judgment rules

The appearance and size deviation of the gasket materials shall comply with the requirements given in Table 5. When any indicator fails to meet the requirements of the Chapter 5 of this document, a retest shall be done using twice the sample

quantity. Results of the retest shall prevail.

If all the quality indicators of gasket materials meet the requirements of this document, the batch is determined qualified, and if any of the quality indicators fails to meet the requirement, the batch is determined unqualified.

8 Marking, packaging, transport and storage

8.1 Marking

8.1.1 Each sheet of gasket materials shall have a clear labeling of the name of manufacturer and the trademark of product. The printing content can be adjusted according to the supplier and the customer 's need.

8.1.2 Each packaging unit shall be accompanied with a certificate of product qualification. The certificate should contain the product name, nominal thickness, physical and mechanical testing requirements and test results, manufactured date and batch number, testing technician or inspection department seal, and name of the manufacturer.

8.1.3 Each packaging shall have a clear label containing the name of the manufacturer, address, telephone number, nominal thickness of the product, product dimensions (length and width), product weight, manufactured date, batch number and so on. Information displaced on the label shall comply with the requirements given in the GB/T 191.

8.2 Packaging

8.2.1 Gasket materials shall be packaged or bundled with plastic or water-proof linings.

8.2.2 Each box (or bundle) of gasket materials should not have more than 2 sample retrieving ports. There should be one retrievable sample with the dimension of no less than 500 mm×500 mm in the package.

8.3 Transport and storage

8.3.1 The gasket materials should be transported in rain-proof and sun-proof vehicles.

8.3.2 The gasket materials should be stored with rain and moisture protection. The storage facility should be kept at the temperature of 0 °C~30 °C. The materials should be stored with protection from direct sunlight. The distance from the heat source and electrical equipment should be at least 1.5 m, as well as from the ground and the wall should be at least 10 cm.

8.3.3 The shelf life of gasket materials is 18 months from the date manufactured.

Annex A
(Informative)

Corresponding code of the product grade mark

The product grade mark listed on this standard corresponds to the code of the GB/T 20671.1, as shown in Table A.1.

Table A.1 Corresponding code of the product grade mark

The product grade mark listed on this standard	Corresponding Code on the GB/T20671.1
GPT-A	F719000—A9B6L000M6TZ
GPT-B	F719000—A9B6L000M5TZ
GPT-C	F719000—A9B6L000M4TZ
GNY-A	F719130—A9B4E33L000M6TZ
GNY-B	F719130—A9B9E33L000M5TZ
GNY-C	F719130—A9E33L000M4TZ

Note: 1. According to the reinforcement fiber and adhesive used, the last 3 digits in the table shall be filled by the manufacturer truthfully in accordance with the GB/T 20671.1.