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(BGA/JSA)

**Preformed gaskets used in
buildings—Classification,
specifications and test methods**

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In the event of any doubts arising as to the contents,
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Contents

	Page
Introduction.....	1
1 Scope.....	1
2 Normative references	1
3 Terms and definitions	3
4 Classification and symbols	4
5 Requirements	6
5.1 Shape and dimensions	6
5.2 Quality	7
5.3 Performance.....	7
6 Tests	15
6.1 General conditions of tests	15
6.2 Preparation of test pieces	15
6.3 Measurement of dimensions	16
6.4 Hardness test	19
6.5 Compressive load test	20
6.6 Tensile test	20
6.7 Compression set test	23
6.8 Heat ageing properties test.....	24
6.9 Heating shrinkage test	28
6.10 Charpy impact strength test.....	29
6.11 Vicat softening temperature test	30
6.12 Low temperature brittleness test	30
6.13 Low temperature bending resistance test.....	31
6.14 Compression force test.....	32
6.15 Ozone resistance test	33
6.16 Weathering resistance test.....	34
7 Inspection.....	35
8 Designation of product.....	35
9 Marking.....	36
Annex JA (informative) Types of preformed gaskets used in buildings	37
Annex JB (informative) Conversion from hardness values in previous edition of this Standard to hardness values in current edition	40

Annex JC (informative)	Comparison table between JIS and corresponding International Standard	42
Annex JD (informative)	Comparison table between previous and current editions of this Standard on technically significant revisions	46

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Manufactures Association of Building Gasket (BGA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently, **JIS A 5756:2006** is replaced with this Standard, and **JIS A 5750:2008** has been withdrawn and replaced with this Standard.

However, **JIS A 5756:2006** may be applied in the **JIS** mark certification based on the relevant provisions of Article 19 Clause 1, etc. of the Industrial Standardization Law until March 20, 2014.

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Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, applications for a patent after opening to the public or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, applications for a patent after opening to the public or utility model rights.

Preformed gaskets used in buildings— Classification, specifications and test methods

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **ISO 3934** published in 2002 with some modifications of the technical contents made to reflect the domestic situations and needs.

The portions given sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JC. The comparison table between previous and current editions of this Standard on technically significant revisions is given in Annex JD.

1 Scope

This Standard specifies the preformed gaskets (hereafter referred to as “gaskets”) made of vulcanized rubber or thermoplastic to be used in buildings. It applies to the following products:

- a) Gaskets for use between external structural members
- b) Gaskets for use between internal structural members
- c) Gaskets used for attaching glasses or the like to door sets and sashes
- d) Gaskets for use inside the frame and inside and outside the stiles around door sets and sashes

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 3934:2002 *Rubber, vulcanized and thermoplastic—Preformed gaskets used in buildings—Classification, specifications and test methods* (MOD)

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 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS A 1415 *Methods of exposure to laboratory light sources for polymeric material of buildings*

JIS B 7739 *Pendulum-type impact-testing machines for Non-Metallic Materials—Verification of testing machines*

JIS K 6200 *Rubber—Vocabulary*

JIS K 6250 *Rubber—General procedures for preparing and conditioning test pieces for physical test methods*

JIS K 6251 *Rubber, vulcanized or thermoplastics—Determination of tensile stress-strain properties*

NOTE : Corresponding International Standard: ISO 37 *Rubber, vulcanized or thermoplastic—Determination of tensile stress-strain properties* (MOD)

JIS K 6253-3 *Rubber, vulcanized or thermoplastic—Determination of hardness—Part 3: Durometer method*

NOTE : Corresponding International Standard: ISO 7619-1 *Rubber, vulcanized or thermoplastic—Determination of indentation hardness—Part 1: Durometer method (Shore hardness)* (MOD)

JIS K 6257 *Rubber, vulcanized or thermoplastic—Determination of heat ageing properties*

NOTE : Corresponding International Standard: ISO 188 *Rubber, vulcanized or thermoplastic—Accelerated ageing and heat resistance tests* (MOD)

JIS K 6259 *Rubber, vulcanized or thermoplastics—Determination of ozone resistance*

NOTE : Corresponding International Standard: ISO 1431-1 *Rubber, vulcanized or thermoplastic—Resistance to ozone cracking—Part 1: Static strain test* (MOD)

JIS K 6261 *Rubber, vulcanized or thermoplastic—Determination of low temperature properties*

NOTE : Corresponding International Standard: ISO 812 *Rubber, vulcanized—Determination of low-temperature brittleness* (MOD)

JIS K 6262 *Rubber, vulcanized or thermoplastic—Determination of compression set at ambient, elevated or low temperatures*

NOTE : Corresponding International Standard: ISO 815 *Rubber, vulcanized or thermoplastic—Determination of compression set at ambient, elevated or low temperatures* (MOD)

JIS K 6272 *Rubber—Tensile, flexural and compression test equipment (constant rate of traverse)—Specification*

JIS K 7111-1 *Plastics—Determination of Charpy impact properties—Part 1: Non-instrumented impact test*

JIS K 7161 *Plastics—Determination of tensile properties—Part 1: General principles*

JIS K 7162 *Plastics—Determination of tensile properties—Part 2: Test conditions for moulding and extrusion plastics*

JIS K 7206 *Plastics—Thermoplastic materials—Determination of Vicat softening temperature (VST)*

JIS K 7350-4 *Plastics—Methods of exposure to laboratory light sources—Part 4: Open-flame carbon-arc lamps*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in JIS K 6200, and the following apply.

3.1 building gasket

formed sealed material to be fitted between exterior or interior building structural members, inside and outside the stiles and the frame around glazing, and door sets and sashes, for the purpose of ensuring watertightness and airtightness

Building gaskets include joint gaskets, glazing gaskets and airtight gaskets, but not setting blocks.

3.2 joint gasket

gasket to be fitted at the joints between building structural members, for the purpose of retaining watertightness and airtightness

Examples are shown in figure JA.1 to figure JA.4.

3.3 glazing gasket

gasket used for attaching glass or the like to a door set or a sash

There are channel type and bead type glazing gaskets. Examples are shown in figure JA.5 to figure JA.8.

3.4 airtight gasket

gasket to be fitted at the frame or the stiles of a door set or a sash, for the purpose of retaining airtightness and watertightness

Examples are shown in figure JA.9 and figure JA.10.

3.5 non-rigid material

gasket or a part of a multiple extruded gasket of vulcanized rubber of which the hardness is A56 to A85 and of thermoplastic that is not foamed of which the hardness is A51 to A93

It is normally called solid.

3.6 cellular material

gasket or a part of a multiple extruded gasket with many air bubbles that are entirely dispersed

It is normally called sponge.

3.7 rigid material

gasket or a part of a multiple extruded gasket of polyvinyl chloride system (PVC system) thermoplastic that is not intentionally softened with additives (plasticizer etc.)

3.8 single extruded gasket

gasket manufactured with single material

3.9 multiple extruded gasket

gasket manufactured by simultaneously forming multiple materials of different material properties classification

3.10 thermal condition

serviceable temperature condition of gasket, i.e. a range of temperature in which the performance of the gasket is sustainable in the environment where the gasket is installed

3.11 nominal hardness

number representing the hardness of a gasket

3.12 thermoplastic

resin of a thermoplastic elastomer system (TPE system) and a polyvinyl chloride system (PVC system)

3.13 heat shrinkage rate

degree of shrinkage of gasket in the length direction caused by heating

3.14 compression force

force needed for compressing a joint gasket or an airtight gasket

3.15 low temperature brittleness

performance of withstanding the low temperature impact brittleness test performed at the lower limit of thermal condition without generating cracks

4 Classification and symbols

4.1 Classification according to use

The gaskets are classified according to use as shown in table 1.

Table 1 Classification according to use

Classification according to use	Symbol
Joint gasket	Jo
Glazing gasket	Gl
Airtight gasket	We

4.2 Classification according to material properties

The gaskets are classified according to material properties as shown in table 2.

For multiple extruded gaskets, the following classification applies respectively to each of the parts differing in material properties.

In this Standard, the rigid material is limited to a PVC system glazing gasket.

Table 2 Classification according to material properties

Classification according to material properties	Symbol
Non-rigid material	Ss
Cellular material	Cl
Rigid material	Hm

4.3 Classification according to form

The gaskets are classified according to form as shown in table 3.

Table 3 Classification according to form

Classification according to form	Symbol
Single extruded gasket	Sf
Multiple extruded gasket	Mf

4.4 Classification according to main component

The gaskets are classified according to main component as shown in table 4.

Table 4 Classification according to main component

Classification according to main component	Symbol
Silicone rubber system (SR system)	SR
Ethylene propylene rubber system (EPDM system)	EPDM
Chloroprene rubber system (CR system)	CR
Thermoplastic elastomer system (TPE system)	TPE
Polyvinyl chloride system (PVC system)	PVC

4.5 Classification according to thermal condition

The gaskets are classified according to thermal condition as shown in table 5.

The gaskets of PVC non-rigid material, CR cellular material and rigid material shall apply to thermal conditions T1 and T3, but not to T2 and T4.

Table 5 Classification according to thermal condition

Thermal condition	Symbol
-20 °C to +70 °C	T1
-20 °C to +85 °C	T2
-40 °C to +70 °C	T3
-40 °C to +85 °C	T4

5 Requirements

5.1 Shape and dimensions

5.1.1 Sectional shape and dimensions

The sectional shape and dimensions of the gasket shall be as agreed between the purchaser and the manufacturer.

5.1.2 Tolerances on sectional dimensions

Unless otherwise specified, the tolerance on dimension of each part of the gasket section shall be that specified in table 6 for parts of non-rigid material and rigid material, and shall be that specified in table 7 for parts of cellular material.

The measurement positions and number of measurement positions shall be as agreed between the purchaser and the manufacturer. Tolerance class for non-rigid material and rigid material gaskets shall be selected normally by referring to table 6.

Table 6 Tolerance on dimension of each part of non-rigid material and rigid material gasket section

Unit: mm

Tolerance on dimension of each part of gasket section		Tolerance (±)	
		Class 1	Class 2
Over 0	1.5 or under	0.15	0.25
Over 1.5	2.5 or under	0.20	0.35
Over 2.5	4.0 or under	0.25	0.40
Over 4.0	6.3 or under	0.35	0.50
Over 6.3	10 or under	0.40	0.70
Over 10	16 or under	0.50	0.80
Over 16	25 or under	0.70	1.00
Over 25	40 or under	0.80	1.30
Over 40	63 or under	1.00	1.60
Over 63	100 or under	1.30	2.00
Applicable main component		TPE system PVC system	SR system EPDM system CR system

Table 7 Tolerance on dimension of each part of cellular material gasket section

Unit: mm

Tolerance on dimension of each part of gasket section		Tolerance (±)
Over 0	3.0 or under	0.4
Over 3.0	5.0 or under	0.5
Over 5.0	10 or under	0.6
Over 10	20 or under	1.0
Over 20	30 or under	1.5
Over 30	40 or under	2.0
Over 40	100 or under	6.0 (%)
Applicable main component		SR system EPDM system CR system

5.2 Quality

5.2.1 Appearance

The gaskets shall be free from flaws, cracks, or other defects detrimental to use on the surface.

The colour of the gasket shall be any colour agreed between the purchaser and the manufacturer.

5.3 Performance

The gaskets shall satisfy the performance requirements given in table 8 that are relevant to their classification according to material property and classification according to thermal condition.

For multiple extruded gaskets which consist of parts differing in material property, each of the parts shall satisfy the performance requirements relevant to the classification it falls under in the material test. The performance values for product test items shall be as agreed between the purchaser and the manufacturer.

Table 8 Performance requirements for gasket and gasket parts

Classification according to material properties	Classification according to thermal condition	Performance specifications
Non-rigid material	T1 or T3	Performance specified in table 9
	T2 or T4	Performance specified in table 10 (not applicable to PVC system)
Cellular material	T1 or T3	Performance specified in table 11
	T2 or T4	Performance specified in table 12 (not applicable to CR system)
Rigid material	T1 or T3	Performance specified in table 13

5.3.1 Non-rigid material

5.3.1.1 General performance requirements

The non-rigid material gasket or the non-rigid material part of a gasket, when tested according to **6.4**, **6.6** to **6.9** and **6.12**, shall conform to the requirements given in table 9 or table 10.

In table 9 and table 10, the range of hardness containing the hardness value agreed between the purchaser and the manufacturer shall apply. For hardness tolerance, the hardness test result of the test performed according to **6.4** shall not deviate from the agreed hardness value by more than ± 3 .

To gaskets of PVC system, thermal conditions T2 and T4 shall not apply.

5.3.1.2 Special performance requirements

Where required, the non-rigid material gasket or the non-rigid material part of a gasket shall be tested according to **6.14** to **6.16** and the results shall conform to the requirements given in table 9 or table 10.

To gaskets of PVC system, thermal conditions T2 and T4 shall not apply.

Tests for special performance requirements shall be performed when agreed between the purchaser and the manufacturer.

5.3.2 Cellular material

5.3.2.1 General performance requirements

The cellular material gasket or the cellular material part of a gasket, when tested according to **6.5** to **6.9** and **6.13**, shall conform to the requirements given in table 11 or table 12.

To gaskets of CR system, thermal conditions T2 and T4 shall not apply.

5.3.2.2 Special performance requirements

Where required, the cellular material gasket or the cellular material part of a gasket, when tested according to **6.14** to **6.16**, shall conform to the requirements given in table 11 or table 12.

To gaskets of CR system, thermal conditions T2 and T4 do not apply.

Tests for special performance requirements shall be performed when agreed between the purchaser and the manufacturer.

5.3.3 Rigid material

5.3.3.1 General performance requirements

The rigid material gasket or the rigid material part of a gasket, when tested according to **6.6** and **6.9** to **6.11**, shall conform to the requirements given in table 13.

To gaskets of rigid material, thermal conditions T2 and T4 shall not apply.

**Table 9 Performance requirements for non-rigid material gasket or the non-rigid material part of a gasket
(classification according to thermal condition: T1, T3)**

Classification according to main component		Performance value														Test method	
		Vulcanized rubber						Thermoplastic									
		SR system	EPDM system CR system	SR system	EPDM system CR system	SR system	EPDM system CR system	TPE system	PVC system	TPE system	PVC system	TPE system	PVC system	TPE system	PVC system		
Nominal hardness		60		70		80		60		70		80		90		6.4	
Range of hardness ^{a)}		56 to 65		66 to 75		76 to 85		51 to 60		61 to 70		71 to 80 ^{c)}		81 to 93			
General performance requirements	Tensile strength (N/mm ²)	7 min.	8.5 min.	7 min.	10.5 min.	7 min.	10.5 min.	7 min.	10.5 min.	4.5 min.	7 min.	6 min.	8 min.	6 min.	9 min.		10 min.
	Elongation (%)	200 min.	200 min.	200 min.	200 min.	150 min.	150 min.	250 min.	300 min.	250 min.	300 min.	350 min.	280 min.	350 min.	250 min.		200 min.
	Compression set (%)	10 max.	30 max.	10 max.	30 max.	10 max.	30 max.	50 max.	70 max.	50 max.	70 max.	50 max.	70 max.	50 max.	70 max.		— ^{d)}
	Heat ageing properties	Change in hardness	+15 to -5	+15 to -5	+15 to -5	+15 to -5	+15 to -5	+15 to -5	±5	+5 to -7	±5	+5 to -7	±5	+5 to -7	±5	+5 to -7	+5 to -7
		Variation in tensile strength (%)	Within -20	Within -20	Within -20	Within -20	Within -20	Within -20	Within -10	Within -10	Within -10	Within -10	Within -10	Within -10	Within -10	Within -10	Within -10
Variation in elongation (%)		Within -20	Within -50	Within -20	Within -50	Within -20	Within -50	Within -15	Within -15	Within -15	Within -15	Within -15	Within -15	Within -15	Within -15	Within -20	
Heating loss (%)	Heating loss (%)	1 max.	3 max.	1 max.	3 max.	1 max.	3 max.	2 max.	2 max.	2 max.	2 max.	2 max.	2 max.	2 max.	2 max.	2 max.	
	Heating shrinkage (%)	1.0 max.	2.0 max.	1.0 max.	2.0 max.	1.0 max.	2.0 max.	1.0 max.	2.5 max.	1.0 max.	2.5 max.	1.0 max.	2.5 max.	1.0 max.	2.5 max.	2.5 max.	
Low temperature brittleness	-20 °C (T1) -40 °C (T3)	Free from cracks.						Free from cracks.								6.12	

Table 9 (concluded)

Classification according to main component		Performance value											Test method
		Vulcanized rubber						Thermoplastic					
		SR system	EPDM system CR system	SR system	EPDM system CR system	SR system	EPDM system CR system	TPE system	PVC system	TPE system	PVC system	TPE system	
Nominal hardness		60	70	80	70	80	60	70	80	90	As agreed between the purchaser and the manufacturer.		6.14
Special performance requirements	Compression force ^{b)}	As agreed between the purchaser and the manufacturer.											
	Ozone resistance ^{b)}	Free from cracks.											
	Weather resistance ^{b)}	As agreed between the purchaser and the manufacturer.											
Notes ^{a)}		For gaskets of the material classification SR system, CR system and EPDM system, the specified hardness values shall be applied as 3-second values. For gaskets of the material classification TPE system and PVC system, the specified hardness values shall be applied as 15-second values.											
		^{b)} Unless otherwise specified, the compression force test, ozone resistance test and weathering resistance test need not be performed.											
		^{c)} For products such as a section fitting part which are used without compression deformation, the compression set test may be omitted as agreed upon between the purchaser and the manufacturer.											
		^{d)} Compression set test need not be performed.											

Table 10 Performance requirements for non-rigid material gasket or the non-rigid material part of a gasket (classification according to thermal condition: T2, T4)

Classification according to main component		Performance value												Test method		
		Vulcanized rubber						Thermoplastic								
		SR system	EPDM system CR system	SR system	EPDM system CR system	SR system	EPDM system CR system	TPE system	PVC system	TPE system	PVC system	TPE system	PVC system			
Nominal hardness		60	70		80		60		70		80		90			
Range of hardness ^{a)}		56 to 65		66 to 75		76 to 85		51 to 60		61 to 70		71 to 80 ^{c)}		81 to 93		
General performance requirements	Tensile strength (N/mm ²)	7 min.	8.5 min.	7 min.	10.5 min.	7 min.	10.5 min.	7 min.	10.5 min.	4.5 min.	6 min.	6 min.	—	6 min.	—	
	Elongation (%)	200 min.	200 min.	200 min.	200 min.	200 min.	200 min.	150 min.	150 min.	250 min.	300 min.	350 min.	—	350 min.	—	
	Compression set (%)	10 max.	30 max.	10 max.	30 max.	10 max.	30 max.	10 max.	30 max.	50 max.	50 max.	50 max.	—	— ^{d)}	—	
	Heat ageing properties	Change in hardness	+15 to -5	+15 to -5	Within -20	Within -20	+15 to -5	Within -20	+15 to -5	Within -20	±5	±5	±5	—	±5	—
		Variation in tensile strength (%)	Within -20	Within -20	Within -20	Within -20	Within -20	Within -20	Within -20	Within -20	Within -10	Within -10	Within -10	—	Within -10	—
		Variation in elongation (%)	Within -20	Within -50	Within -20	Within -50	Within -20	Within -50	Within -20	Within -50	Within -15	Within -15	Within -15	—	Within -15	—
		Heating loss (%)	1 max.	3 max.	1 max.	3 max.	1 max.	3 max.	1 max.	3 max.	2 max.	2 max.	2 max.	—	2 max.	—
Heating shrinkage (%)	1.0 max.	2.0 max.	1.0 max.	2.0 max.	1.0 max.	2.0 max.	1.0 max.	2.0 max.	1.0 max.	1.0 max.	1.0 max.	—	1.0 max.	—		
Low temperature brittleness	-20 °C (T2)	Free from cracks.						Free from cracks.						6.12		
	-40 °C (T4)															

Table 10 (concluded)

Classification according to main component		Performance value												Test method
		Vulcanized rubber						Thermoplastic						
		SR system	EPDM system CR system	SR system	EPDM system CR system	SR system	EPDM system CR system	TPE system	PVC system	TPE system	PVC system	TPE system	PVC system	
Nominal hardness		60	70	80	70	80	60	70	80	60	70	80	90	6.14
Special performance requirements	Compression force ^{b)}	As agreed between the purchaser and the manufacturer.						As agreed between the purchaser and the manufacturer.						
	Ozone resistance ^{b)}	Free from cracks.						Free from cracks.						
	Weather resistance ^{b)}	As agreed between the purchaser and the manufacturer.						As agreed between the purchaser and the manufacturer.						
Notes ^{a)}		For gaskets of the material classification SR system, CR system and EPDM system, the specified hardness values shall be applied as 3-second values. For gaskets of the material classification TPE system and PVC system, the specified hardness values shall be applied as 15-second values.												
		Unless otherwise specified, the compression force test, ozone resistance test and weathering resistance test need not be performed.												
		For products such as a section fitting part which are used without compression deformation, the compression set test may be omitted as agreed upon between the purchaser and the manufacturer.												
		Compression set test need not be performed.												

Table 11 Performance requirements for cellular material gasket or the cellular material part of a gasket (classification according to thermal condition: T1, T3)

Performance requirement items				Performance value			Test method
				SR system	EPDM system	CR system	
General performance requirements	Compressive load (N/mm ²)		—	0.13 max.			6.5
	Compression set (%)		70 °C	10 max.	40 max.	40 max.	6.7
	Heat ageing properties	Variation in compressive load (%)	85 °C	Within 10	Within 25	Within 30	6.8
		Variation in tensile strength (%)		Within 15	Within 15	Within 15	
		Variation in elongation (%)		Within 30	Within 30	Within 30	
	Heating shrinkage (%)		70 °C	1 max.	2 max.	2 max.	6.9
	Low temperature bending resistance		-20 °C (T1)	Free from cracks.			6.13
			-40 °C (T3)				
Special performance requirements	Compression force ^{a)}		—	As agreed between the purchaser and the manufacturer.			6.14
	Ozone resistance ^{a)}		—	Free from cracks.			6.15
	Weathering resistance ^{a)}		—	As agreed between the purchaser and the manufacturer.			6.16
Note ^{a)} Unless otherwise specified, the compression force test, ozone resistance test and weathering resistance test need not be performed.							