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**Dimensions of gaskets for use with pipe
flanges**

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Foreword

This Japanese Industrial Standard has been 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 The Japan Society of Mechanical Engineers (JSME)/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 B 2404:2006** is replaced with this Standard.

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Dimensions of gaskets for use with pipe flanges

Introduction

This Japanese Industrial Standard specifies the dimensions of gaskets used for the pipe flanges (hereafter referred to as flanges).

This Standard was established in 1967 as “Spiral-wound gaskets for pipe flanges”, and has gone through revisions up to the present including the revision made in 1999, in which this Standard was changed to the standard for dimensions of gaskets. The last revision was made in 2006, and the revision at this time is to ensure the consistency with the relevant standards revised thereafter, and to correspond to changes in the applicable products.

The flanges specified in **ISO 7005-1**, **ISO 7005-2** and **ISO 7005-3** are different from those using the gaskets specified in this Standard. No corresponding International Standard has been established at this point. This Standard does not cover the materials of gaskets and the criteria for use.

1 Scope

This Standard specifies the types and dimensions of gaskets used for flanges specified in the main texts of **JIS B 2220**, **JIS B 2239**, **JIS B 2240** and **JIS B 2241** connected to the piping for fluids such as steam, water and oil. This Standard is not applicable to gaskets corresponding to the flanges specified in **ISO 7005-1**, **ISO 7005-2** and **ISO 7005-3**.

The dimensions of gaskets used for flanges shown in Annex E of **JIS B 2220** are shown in Annex A for reference.

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 B 0116 *Glossary of terms for packings and gaskets*

JIS B 2220 *Steel pipe flanges*

JIS B 2239 *Cast iron pipe flanges*

JIS B 2240 *Copper alloy pipe flanges*

JIS B 2241 *Aluminium alloy pipe flanges*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS B 0116** apply.

4 Types and forms of gaskets

The types and forms of gaskets are as given in Table 1.

Respective forms are applicable only to the certain nominal sizes and nominal pressures depending on the scope of products.

The inserts of cut gaskets and PTFE-jacketed gaskets shall be solid without seam. If such solid products cannot be manufactured, the purchaser should consult the gasket manufacturer or supplier.

The envelope of PTFE-jacketed gaskets shall be made of polytetrafluoroethylene (PTFE) resin, and the insert shall be the compressed fibre sheet as the reference. Regarding other materials, the purchaser should consult the gasket manufacturer or supplier. Generally, the fin type envelope (Type S) shall be used for the small- or medium-bore products, and the square type envelope (Type M) shall be used in the case where the stagnation of fluid at the inside diameter part needs to be eliminated. The rounded type envelope (Type F) corresponds to the medium- or large-bore products.

The spiral wound gasket with centring ring shall apply to the flat face flanges and raised face flanges. For the male and female flanges, and the tongue and groove flanges, the centring ring is not required. Spiral wound gaskets without inner ring are likely to cause a deformation, “buckling”, around the inside diameter part when it is excessively compressed or slipped on the flange face. As the nominal pressure or the nominal size becomes larger, the tightening force tends to be excessively large. Also, the expanded graphite and the fluororesin filler are likely to cause a slip on the flange face. In such a case where the buckling above is predicted, the gaskets with centring and inner rings should be used for the flat face flanges and the raised face flanges, and the gaskets with inner ring should be used for the male and female flanges.

5 Combinations of flanges and gaskets

The combinations between standards for flanges and types of gaskets are as given in Table 2.

The combinations of types and forms of gaskets according to the gasket face are as given in Table 3 to Table 5. The purchaser should confirm with the gasket manufacturer or supplier about the pressure — temperature rating for each gasket and fluid.

In Table 3, when a cut gasket applies to a flat-face socket welding flange (plate flange : SOP) and a blank flange (BL), a full-face gasket should be used instead of a ring gasket so that the bending moment on the flange does not become excessively large for flanges of nominal size 400A or larger with 5K in nominal pressure, and those of nominal size 250A or larger with 10K in nominal pressure (see **JIS B 2220**).

Table 1 Types and forms of gaskets

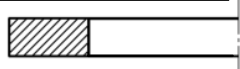
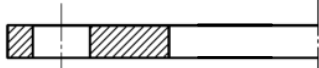
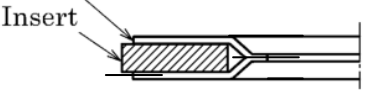
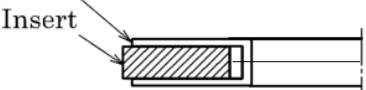
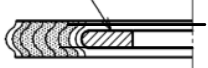
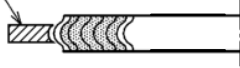
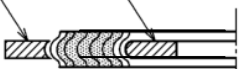
Type of gasket		Form of gasket	
Cut gasket	Rubber sheet (including rubber sheet with fabric insertion)	Ring gasket	
	Compressed fibre sheet		
	PTFE skived sheet		
	Expanded PTFE sheet	Full-face gasket	
	High-density expanded PTFE sheet		
	Filled PTFE rolled sheet		
	Expanded graphite sheet (including metal-reinforced product)		
PTFE-jacketed gasket		Fin type envelope (Type S)	
		Square type envelope (Type M)	
		Rounded type envelope (Type F)	
Spiral wound gasket ^{a)}		Sealing element only	
		With inner ring	
		With centring ring	
		With inner and centring rings	
Note ^{a)} Profiles of winding metal are examples.			

Table 2 Combinations of standards for flanges and types of gaskets

Type of gasket	JIS B 2220 (Steel)	JIS B 2239 (Cast iron)	JIS B 2240 (Copper alloy)	JIS B 2241 (Aluminium alloy)
Cut gasket	○	○	○	○
PTFE-jacketed gasket	○	○	○	○
Spiral wound gasket	○	○	—	—
NOTE The symbol ○ in the table indicates the applicable combinations. The purchaser should consult the gasket manufacturer or supplier as to the combinations indicated by the symbol —.				

Table 3 Combinations of types and forms of gaskets used for flat face flanges and raised face flanges

Type and form of gasket		Nominal pressure of flat face flange			Nominal pressure of raised face flange							
		5K	10K ^{a)}	16K	5K	10K	10K Thin type	16K	20K	30K	40K	63K
Rubber sheet (including rubber sheet with fabric insertion)	Full-face gasket	○	○	—	—	—	—	—	—	—	—	—
	Ring gasket	—	—	—	—	—	—	—	—	—	—	—
Compressed fibre sheet	Full-face gasket	○	○	○	○	○	○	○	○	○	—	—
	Ring gasket	○	○	○	○	○	○	○	○	○	—	—
PTFE skived sheet	Full-face gasket	○	○	—	○	○	○	—	—	—	—	—
	Ring gasket	○	○	—	○	○	○	—	—	—	—	—
Expanded PTFE sheet	Full-face gasket	○	○	○	○	○	○	○	○	—	—	—
	Ring gasket	○	○	○	○	○	○	○	○	—	—	—
High-density expanded PTFE sheet	Full-face gasket	○	○	○	○	○	○	○	○	○	—	—
	Ring gasket	○	○	○	○	○	○	○	○	○	—	—
Filled PTFE rolled sheet	Full-face gasket	○	○	○	○	○	○	○	○	○	—	—
	Ring gasket	○	○	○	○	○	○	○	○	○	—	—
Expanded graphite sheet (including metal-reinforced product)	Full-face gasket	○	○	○	○	○	○	○	○	○	—	—
	Ring gasket	○	○	○	○	○	○	○	○	○	—	—
PTFE-jacketed gaskets		○	○	○	○	○	—	○	○	—	—	—
Spiral wound gasket	With centring ring ^{b)}	—	—	—	—	○	—	○	○	○	○	○
	With inner and centring rings	—	—	—	—	○ ^{c)}	—	○	○	○	○	○

NOTE The symbol ○ in the table indicates the applicable combinations. The purchaser should consult the gasket manufacturer or supplier as to the combinations indicated by the symbol —, and the application of the full-face gaskets other than rubber sheet (including the rubber with fabric insertion) of 5K and 10K flanges.

Notes ^{a)} Includes 10K thin type.

^{b)} The purchaser should consult the gasket manufacturer or supplier as to the gaskets with inner and centring rings in the case where the buckling is predicted on the inside diameter side.

^{c)} Dimensions differ among the manufactures; the purchaser should consult the gasket manufacturer or supplier.

Table 4 Combinations of types and forms of gaskets used for male and female flanges

Type and form of gasket		Nominal pressure of male and female flange					
		10K	16K	20K	30K	40K	63K
Rubber sheet (including rubber sheet with fabric insertion)	Ring gasket	○	—	—	—	—	—
Compressed fibre sheet	Ring gasket	○	○	○	○	—	—
PTFE skived sheet	Ring gasket	○	○	—	—	—	—
Expanded PTFE sheet	Ring gasket	○	○	○	—	—	—
High-density expanded PTFE sheet	Ring gasket	○	○	○	○	—	—
Filled PTFE rolled sheet	Ring gasket	○	○	○	○	—	—
Expanded graphite sheet (including metal-reinforced product)	Ring gasket	○	○	○	○	—	—
Spiral wound gasket	Sealing element only ^{a)}	○	○	○	○	○	○
	With inner ring	○	○	○	○	○	○
NOTE The symbol ○ in the table indicates the applicable combinations. The purchaser should consult the gasket manufacturer or supplier as to the combinations indicated by the symbol —. Note ^{a)} The purchaser should consult the gasket manufacturer or supplier as to the gaskets with inner ring in the case where the buckling is predicted on the inside diameter side.							

Table 5 Combinations of types and forms of gaskets used for tongue and groove flanges

Type and form of gasket		Nominal pressure of tongue and groove flange					
		10K	16K	20K	30K	40K	63K
Rubber sheet (including rubber sheet with fabric insertion)	Ring gasket	○	—	—	—	—	—
Compressed fibre sheet	Ring gasket	○	○	○	○	—	—
PTFE skived sheet	Ring gasket	○	○	○	—	—	—
Expanded PTFE sheet	Ring gasket	○	○	○	—	—	—
High-density expanded PTFE sheet	Ring gasket	○	○	○	○	—	—
Filled PTFE rolled sheet	Ring gasket	○	○	○	○	—	—
Expanded graphite sheet (including metal-reinforced product)	Ring gasket	○	○	○	○	—	—
Spiral wound gasket	Sealing element only	○	○	○	○	○	○
NOTE The symbol ○ in the table indicates the applicable combinations. The purchaser should consult the gasket manufacturer or supplier as to the combinations indicated by the symbol —.							

6 Dimensions

6.1 Cut gaskets

6.1.1 Inside diameter and outside diameter

The inside diameter, outside diameter, diameter of circle formed by bolt holes, bolt hole diameter and the number of bolt holes of cut gaskets are as given in Table 6 to Table 10.

The purchaser should consult the gasket manufacturer or supplier as to the gaskets with 1 000 mm or over in the outside diameter because of the difficulty in manufacturing the gaskets of some sizes.