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HG

HG/T 20633-2009

Replacing HG 20633-1997

Metallic Ring Joint Gaskets for Use with Steel Pipe Flanges

(Class Designated)

钢制管法兰用金属环形垫

(Class 系列)

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1. Scope

This standard specifies the type, dimension, technical requirements, marking and sign of metallic ring joint gaskets for use with steel pipe flanges (Class designated).

This standard is applicable to the metallic ring joint gaskets for use with steel pipe flanges whose nominal pressures are from Class150 (PN20)- Class2500 (PN420) which are specified in HG/T 20615 and HG/T 20623.

2. Normative references

The following provisions contained in the following standards are turned into the provisions of this national standard by being referred in this national standard. For date reference, the subsequent amendments to (excluding amending error in the text) or revisions of, any of these publications do not apply. And parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. For undated references, its latest edition referred to applies.

GB/T 222 "Permissible Tolerances for Chemical Composition of Steel Products"

GB/T 699 "Quality Carbon Structural Steels"

GB/T 1220 "Stainless Steel Bars"

GB/T 6060.2 "Roughness Comparison Specimens-Ground, Turned, Bored, Milled, Shaped and Planed"

GB/T 6983 "Technical Requirements for Magnetic Iron Bars"

HG/T 20615 "Steel Pipe Flange (Class Designated)"

HG/T 20623 "Major Diameter Steel Pipe Flange (Class Designated)"

HG/T 20635 "Specification for Selection of Steel Pipe Flange, Gaskets and Bolting (Class designated)"

JB 4726 "Carbon and Low-alloy Steel Forgings for Pressure Vessels"

JB 4728 "Stainless Steel Forgings for Pressure Vessels"

3. General provisions

3.1 Type

As for metallic ring joint gaskets for use with the flange with ring-groove sealing surface, it shall be classified into elliptic type and octagonal type according to the sectional form (see Figure 3.1).

Table 3.3.1 Material, Code Name and Maximum Service Temperature of Metal Ring Joint Gaskets

The material of the metal ring joint gaskets		Maximum hardness		Code name	Maximum service temperature (°C)
Steel grade	Standard	HBS	HRB		
Pure iron ^a	GB/T 9971	90	56	D	540
10	GB/T 699	120	68	S	540
1Cr5M0	JB 4726	130	72	F5	650
0Cr13	JB 4728 GB/T 1220	170	86	410S	650
0Cr18Ni9		160	83	304	700 ^b
00Cr19Ni10		150	80	304L	450
0Cr17Ni12M02		160	83	316	700 ^b
00Cr17Ni14M02		150	80	316L	450
0Cr18Ni10Ti		160	83	321	700 ^b
0Cr18Ni11Nb		160	83	347	700 ^b

^a The chemical composition of the pure iron is as follows:

%

C	Si	Mn	P	S
≤0.05	≤0.40	≤0.60	≤0.035	≤0.040

^b If the temperature of the working condition exceeds 540°C, it shall be agreed with the manufacturing plant.

4. Dimension

The dimension of the metal ring joint gaskets shall meet the requirements of Figure 3.1, Table 4-1 and Table 4-2.

Table 4-2 Dimension Table of the Metal Ring Joint Gaskets (mm)

Ring Number R	Pitch diameter P	Ring width A	Ring height		The width of the ring plane for the octagonal gasket C	Radius of rounded angle r
			Elliptic type B	Octagonal gasket H		
R11	34.14	6.35	11.11	9.53	4.32	1.6
R12	39.67	7.94	14.29	12.70	5.23	1.6
R13	42.88	7.94	14.29	12.70	5.23	1.6
R14	44.45	7.94	14.29	12.70	5.23	1.6
R15	47.63	7.94	14.29	12.70	5.23	1.6
R16	50.80	7.94	14.29	12.70	5.23	1.6
R17	57.15	7.94	14.29	12.70	5.23	1.6
R18	60.33	7.94	14.29	12.70	5.23	1.6
R19	65.07	7.94	14.29	12.70	5.23	1.6
R20	68.27	7.94	14.29	12.70	5.23	1.6
R21	72.23	11.11	17.46	15.88	7.75	1.6
R22	82.55	7.94	14.29	12.70	5.23	1.6
R23	82.55	11.11	17.46	15.88	7.75	1.6
R24	95.25	11.11	17.46	15.88	7.75	1.6
R25	101.60	7.94	14.29	12.70	5.23	1.6
R26	101.60	11.11	17.46	15.88	7.75	1.6
R27	107.95	11.11	17.46	15.88	7.75	1.6
R28	111.13	12.70	19.05	17.46	8.66	1.6
R29	114.30	7.94	14.29	12.70	5.23	1.6
R30	117.48	11.11	17.46	15.88	7.75	1.6
R31	123.83	11.11	17.46	15.88	7.75	1.6
R32	127.00	12.70	19.05	17.46	8.66	1.6
R35	136.53	11.11	17.46	15.88	7.75	1.6
R36	149.23	7.94	14.29	12.70	5.23	1.6
R37	149.23	11.11	17.46	15.88	7.75	1.6
R38	157.18	15.88	22.23	20.64	10.49	1.6
R39	161.93	11.11	17.46	15.88	7.75	1.6
R40	171.45	7.94	14.29	12.70	5.23	1.6
R41	180.98	11.11	17.46	15.88	7.75	1.6
R42	190.50	19.05	25.40	23.81	12.32	1.6
R43	193.68	7.94	14.29	12.70	5.23	1.6
R44	193.68	11.11	17.46	15.88	7.75	1.6
R45	211.12	11.11	17.46	15.88	7.75	1.6

(Continued)			(mm)		
Ring No. R	Pitch diameter P	Ring width A	Ring height of the octagonal gasket H	Ring plane width C	Radius of rounded angle r
R93	749.30	19.50	23.90	12.32	1.6
R94	800.10	19.50	23.90	12.32	1.6
R95	857.25	19.50	23.90	12.32	1.6
R96	914.40	22.22	26.90	14.81	1.6
R97	965.20	22.22	26.90	14.81	1.6
R98	1022.35	28.58	26.90	14.81	2.4
R100	749.30	31.75	35.10	19.81	2.4
R101	800.10	31.75	38.10	22.33	2.4
R102	857.25	31.75	38.10	22.33	2.4
R103	914.40	31.75	38.10	22.33	2.4
R104	965.20	34.92	41.10	24.82	2.4
R105	1022.35	34.92	41.10	24.82	2.4

Note: R93 - R105 are only applicable to HG/T 20623A designated flange.

5. Technical requirements

5.1 Appearance

There shall not be such defects as scratch, pit and cracks which impact the sealing property of the metal ring joint gaskets. Surface roughness of the sealing surface: $Ra \leq 1.6\mu m$.

5.2 Dimension tolerance

Dimension tolerance of metal ring joint gaskets shall meet the requirements of Table 5.2.

Table 5.2 Dimension Tolerance of the Metal Ring Joint Gaskets (mm)

Item	Dimension tolerance
P	± 0.18
A	± 0.20
B or H	± 0.50
C	± 0.20
r	± 0.5
23°	$\pm 0.5^\circ$

5.3 Manufacture

5.3.1 Metal ring joint gaskets usually are made integrally of steel bar, seamless tube and forging. If other materials are adopted, it shall be agreed with the users.

5.3.2 Pony-size ring gasket may be made directly by the steel bar and seamless tube though mechanical processing; while the larger size ring gasket usually is made into integral circle which is formed by the forging through heat treatment and mechanical processing.

5.3.3 As for the metal ring joint gaskets that the materials (pure iron, 10 steel and 1Cr5Mo) which are easy to rusty are adopted, the surface shall be coated with antirust after inspection. Anti-corrosive treatment shall be carried out for stainless steel ring joint gasket according to the users' requirements.

5.4 Inspection

5.4.1 Appearance and Dimensional Gauging

Before ex-works, the appearance of the ring joint gasket shall be inspected visually. Visual method shall be adopted for the surface roughness; and it shall be compared with standard specimen (GB/T 6060.2). The special measuring device shall be adopted for the inspection of the pitch diameter, ring width and ring height and angle and plane width of the octagonal gasket; and it shall meet the requirements of Table 5.2.

5.4.2 Material Inspection

Chemical composition of the metal ring joint gaskets shall meet the relevant requirements of Table 3.3.1. Allowable deviation of the product analysis and specified value shall meet the requirements of GB/T 222.

5.4.3 Hardness Inspection

1 Brinell hardness method shall be adopted for the random inspection of the blank hardness; and it shall meet the requirements of Table 3.3.1.

2 Rockwell hardness method shall be adopted for the random inspection of the product hardness. Two parts shall be inspected symmetrically below R23. four parts shall be inspected symmetrically over R24. The average value shall meet the requirements of Table 3.3.1.

5.5 Performance test and method

Performance test and method of metal ring joint gaskets shall be determined according to the relevant standard which is specified by the users.

6. Inspection

6.0.1 The material, dimension, appearance and hardness of the gasket shall meet the requirements of this standard.

6.0.2 If other requirements are proposed by the user, it shall be agreed with the manufacturing

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