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भारतीय मानक मसौदा

पाइप फ्लैंजो के लिए छल्लेनुमा जोड़ गैस्केट और खांचें — विशिष्टि

(आई एस 13257 का पहला पुनरीक्षण)

DRAFT Indian Standard

**RING TYPE JOINT GASKETS AND GROOVES
FOR PIPE FLANGES — SPECIFICATION**

(First Revision of IS 13257)

ICS 23.040.80

**Gaskets and Packing Sectional
Committee, MED 30**

**Last date for receipt of comments
is 26 June 2025**

FOREWORD

(Formal clause to be added later)

R, RX, BX, and SBX ring type joint (RTJ) gaskets are specialized sealing components used in high-pressure, high-temperature applications, particularly in oil and gas, petrochemical, and refinery industries. These gaskets are designed to form a reliable seal between RTJ flanges, ensuring a secure connection in critical piping systems.

This standard was originally issued in 1992. The present revision has been taken up with a view to incorporating the modifications found necessary as a result of experience gained in the use of this standard. Also, in this revision, the standard has been brought into latest style and format of Indian Standards, and references to Indian Standards, wherever applicable have been updated. BIS certification marking clause has been modified to align with the revised Bureau of Indian Standards Act, 2016.

The major changes in this revision are as follows:

- a) Scope has been revised to bring more clarity;

- b) New type of gaskets and grooves are added;
- c) Material requirements have been revised; and
- d) Dimensional requirements of SBX ring type gaskets have been incorporated.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

DRAFT Indian Standard
RING TYPE JOINT GASKETS AND GROOVES
FOR PIPE FLANGES — SPECIFICATION
(*First Revision*)

1 SCOPE

This Indian Standard covers material, dimensions, tolerances, and marking for ring type joint gasket and grooves for pipe flanges.

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subjected to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed here:

<i>IS/ISO No.</i>	<i>Title</i>
IS 2500 (Part 1) : 2000 ISO 2859-1:1999	Sampling procedures for inspection by attributes — Part 1 : Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
IS 1500 (Part 1) : 2019/ ISO 6506-1 : 2014	Metallic materials — Brinell hardness test Part 1 Test method (<i>fifth revision</i>)
IS 1586 (Part 1) : 2018/ ISO 6508-1 : 2016	Metallic materials — Rockwell hardness test Part 1 Test method (<i>fifth revision</i>)
IS 1599 : 2023/ ISO 7438 : 2020	Metallic Materials — Bend Test (<i>fifth revision</i>)
IS 13417 : 2024	Heat treatment of steel — Code of practice (<i>first revision</i>)
IS 1586 (Part 1) : 2018	Metallic materials — Rockwell hardness test Part 1 Test method (<i>fifth revision</i>)

3 TERMINOLOGY

For the purpose of this standard the following definitions shall apply.

3.1 Asbestos — Asbestos is a collective name given to naturally occurring fibrous silicate material. The most commonly used is chrysotile fiber.

3.2 Gasket — Deformable material (or combination of materials) intended to be clamped between flanges to prevent leakage of contained fluid.

4 GASKET TYPES

The following types of gaskets and grooves covered in this standard:

<i>Sl No.</i> (1)	<i>Type</i> (2)	<i>Pressure (Pa)</i> (3)	<i>Shape</i> (4)	<i>Application (Examples)</i> (5)
i)	R	< 3 447.38 (5 000 PSI)	Oval and octagonal cross sections	Oil and gas, petrochemicals, and power generation.
ii)	RX	< 3 447.38 (5 000 PSI)	Octagonal cross sections	Pressure energizing effect like subsea application and oil and gas industries.
iii)	BX	< 137 895.15 (20 000 PSI)	Octagonal cross sections	Oil drilling and petrochemical applications.
iv)	SBX	< 137 895.15 (20 000 PSI)	Same design as the Type RX and BX gaskets	Subsea wellheads, underwater equipment, and other applications where extreme conditions exist

NOTE: 1 KPa = 0.145 038 PSI

The bottom of the groove in all types of flanges for ring gaskets shall be flat.

5 MATERIALS

Ring type joint gaskets shall be produced from material to suit the operating conditions.

5.1 Processing

The following processes are acceptable for the materials of ring type gaskets.

- a) *Melting* — The manufacturer shall select and specify the melting process(s) used to produce homogeneous materials free from cracks, banding, piping, and flakes for ring gaskets.
- b) *Casting* — Centrifugal casting shall be the only acceptable method of casting ring gaskets.
- c) *Hot Working* :
 - 1) Forged rings are acceptable for ring gaskets; and
 - 2) Wrought products shall be hot worked throughout. Ring gaskets may be made from pierced tubing or pipe, rolled rings, or rolled and welded bar or plate.

5.2 Heat-Treating

Heat-treatment process shall be as per IS 13417 or any other relevant national standard based on the material of ring type gaskets. Hardness of the heat-treated ring type gaskets shall conform to Table 1.

Table 1 Hardness
(Clauses 5.2 and 9.3)

Sl No. (1)	Material (2)	Maximum Hardness in	
		Brinell (HBW) (3)	Rockwell (HRBW) (4)

i)	Soft iron	90	56
ii)	Low carbon steel	120	68
iii)	4-6 % Cr 0.5 % Mo steel	130	72
iv)	Type 304 steel	160	83
v)	Type 316 steel	160	83
vi)	Type 347 steel	160	83
vii)	Type 410 steel	170	85

Material shall conform to corresponding Indian Standards.

6 MATERIAL QUALIFICATION TESTING

6.1 Chemical Composition

The chemistry of ring type gaskets shall be as described in the ring gasket manufacturer's specification to meet the specified application and service conditions.

6.2 Mechanical Testing

Method of hardness test shall be done as per IS 1500 (Part 1)/ ISO 6506-1 and IS 1586 (Part 1)/ ISO 6508-1 as applicable.

7 DESIGN

7.1 Dimensions and Tolerance

R, RX, BX, and SBX ring type gaskets shall be as per the dimensions and tolerances specified in Table 2, Table 3, Table 4, and Table 5 respectively.

Table 2 R Type Gasket Dimensions and Tolerances
(Clause 7.1)



FIG. 1 R TYPE RING GASKETS

SI No.	Ring Number	R TYPE GASKETS DIMENSIONS					R Groove Dimensions			
		Average Pitch Diameter	Width	Width of flat	Height of Ring		Radius in Octagonal Ring	Depth	Width	Bottom Radius
		P	A	C	Octagonal	Oval	R ₁	E	F	R
		±0.18	±0.20	±0.20	±0.50	±0.50	±0.50	+0.41/0.00	±0.20	≤1.5 +0.80 / 0.00 >1.5 ±0.80
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
i)	R11	34.14	6.35	4.32	9.70	11.20	1.50	5.56	7.14	0.80
ii)	R12	39.70	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
iii)	R13	42.88	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
iv)	R14	44.45	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
v)	R15	47.63	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
vi)	R16	50.80	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
vii)	R17	57.15	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
viii)	R18	60.33	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
ix)	R19	65.10	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
x)	R20	68.28	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xi)	R21	72.24	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xii)	R22	82.55	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xiii)	R23	82.55	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xiv)	R24	95.25	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xv)	R25	101.60	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xvi)	R26	101.60	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xvii)	R27	107.95	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xviii)	R28	111.13	12.70	8.66	17.50	19.10	1.50	9.52	13.49	1.50
xix)	R29	114.30	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xx)	R30	117.48	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xxi)	R31	123.83	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xxii)	R32	127.00	12.70	8.66	17.50	19.10	1.50	9.53	13.49	1.50
xxiii)	R33	131.78	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xxiv)	R34	131.78	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xxv)	R35	136.53	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xxvi)	R36	149.23	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xxvii)	R37	149.23	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xxviii)	R38	157.18	15.88	10.49	20.60	22.40	1.50	11.13	16.66	1.50
xxix)	R39	161.93	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xxx)	R40	171.45	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xxxi)	R41	180.98	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xxxii)	R42	190.50	19.05	12.32	23.90	25.40	1.50	12.70	19.84	1.50
xxxiii)	R43	193.68	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xxxiv)	R44	193.68	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xxxv)	R45	211.15	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xxxvi)	R46	211.15	12.70	8.66	17.50	19.10	1.50	9.52	13.49	1.50
xxxvii)	R47	228.60	19.05	12.32	23.90	25.40	1.50	12.70	19.84	1.50
xxxviii)	R48	247.65	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xxxix)	R49	269.88	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80

SI No.	Ring Number	R TYPE GASKETS DIMENSIONS					R Groove Dimensions			
		Average Pitch Diameter	Width	Width of flat	Height of Ring		Radius in Octagonal Ring	Depth	Width	Bottom Radius
		P	A	C	Octagonal	Oval	R ₁	E	F	R
		±0.18	±0.20	±0.20	±0.50	±0.50	±0.50	+0.41/0.00	±0.20	≤1.5 +0.80 / 0.00 >1.5 ±0.80
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
xl)	R50	269.88	15.88	10.49	20.60	22.40	1.50	11.13	16.66	1.50
xli)	R51	279.40	22.23	14.81	26.90	28.70	1.50	14.27	23.01	1.50
xl ii)	R52	304.80	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xl iii)	R53	323.85	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xl iv)	R54	323.85	15.88	10.49	20.60	22.40	1.50	11.13	16.66	1.50
xl v)	R55	342.90	28.58	19.81	35.10	36.60	2.30	17.48	30.18	2.30
xl vi)	R56	381.00	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
xl vii)	R57	381.00	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
xl viii)	R58	381.00	22.23	14.81	26.90	28.70	1.50	14.27	23.01	1.50
xl ix)	R59	396.88	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
l)	R60	406.40	31.75	22.33	38.10	39.60	2.30	17.48	33.32	2.30
li)	R61	419.10	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
li i)	R62	419.10	15.88	10.49	20.60	22.40	1.50	11.13	16.66	1.50
li ii)	R63	419.10	25.40	17.30	31.80	33.30	2.30	15.88	26.97	2.30
li v)	R64	454.03	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
li v)	R65	469.90	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
li vi)	R66	469.90	15.88	10.49	20.60	22.40	1.50	11.13	16.66	1.50
li vii)	R67	469.90	28.58	19.81	35.10	36.60	2.30	17.48	30.18	2.30
li viii)	R68	517.53	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
li x)	R69	533.40	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
li x)	R70	533.40	19.05	12.32	23.90	25.40	1.50	12.70	19.84	1.50
li xi)	R71	533.40	28.58	19.81	35.10	36.60	2.30	17.48	30.18	2.30
li xii)	R72	558.80	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
li xiii)	R73	584.20	12.70	8.66	17.50	19.10	1.50	9.52	13.49	1.50
li xiv)	R74	584.20	19.05	12.32	23.90	25.40	1.50	12.70	19.84	1.50
li xv)	R75	584.20	31.75	22.33	38.10	39.60	2.30	17.48	33.32	2.30
li xvi)	R76	673.10	7.95	5.23	12.70	14.20	1.50	6.35	8.74	0.80
li xvii)	R77	692.15	15.88	10.49	20.60	22.40	1.50	11.13	16.66	1.50
li xviii)	R78	692.15	25.40	17.30	31.80	33.30	2.30	15.88	26.97	2.30
li xix)	R79	692.15	34.93	24.82	41.40	44.50	2.30	20.60	36.50	2.30
li xx)	R80	615.95	7.95	5.23	12.70	---	1.50	6.35	8.74	0.80
li xxi)	R81	635.00	14.30	9.58	19.10	---	1.50	11.10	15.10	1.50
li xxii)	R82	57.15	11.13	7.75	16.00	---	1.50	7.92	11.91	0.80
li xxiii)	R84	63.50	11.13	7.75	16.00	---	1.50	7.92	11.91	0.80
li xxiv)	R85	79.38	12.70	8.66	17.50	---	1.50	9.52	13.49	1.50
li xxv)	R86	90.50	15.88	10.49	20.60	---	1.50	11.13	16.66	1.50
li xxvi)	R87	100.03	15.88	10.49	20.60	---	1.50	11.13	16.66	1.50
li xxvii)	R88	123.83	19.05	12.32	23.90	---	1.50	12.70	19.84	1.50
li xxviii)	R89	114.30	19.05	12.32	23.90	---	1.50	12.70	19.84	1.50
li xxix)	R90	155.58	22.23	14.81	26.90	---	1.50	14.27	23.01	1.50

SI No.	Ring Number	R TYPE GASKETS DIMENSIONS					R Groove Dimensions			
		Average Pitch Diameter	Width	Width of flat	Height of Ring		Radius in Octagonal Ring	Depth	Width	Bottom Radius
		P	A	C	Octagonal	Oval	R ₁	E	F	R
		±0.18	±0.20	±0.20	±0.50	±0.50	±0.50	+0.41/0.00	±0.20	≤1.5 +0.80 / 0.00 >1.5 ±0.80
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
lxxx)	R91	260.35	31.75	22.33	38.10	---	2.30	17.48	33.32	2.30
lxxxi)	R92	228.60	11.13	7.75	16.00	17.50	1.50	7.92	11.91	0.80
lxxxii)	R93	749.30	19.05	12.32	23.90	---	1.50	12.70	19.84	1.50
lxxxiii)	R94	800.10	19.05	12.32	23.90	---	1.50	12.70	19.84	1.50
lxxxiv)	R95	857.25	19.05	12.32	23.90	---	1.50	12.70	19.84	1.50
lxxxv)	R96	914.40	22.23	14.81	26.90	---	1.50	14.27	23.01	1.50
lxxxvi)	R97	965.20	22.23	14.81	26.90	---	1.50	14.27	23.01	1.50
lxxxvii)	R98	1022.35	22.23	14.81	26.90	---	1.50	14.27	23.01	1.50
lxxxviii)	R99	234.95	11.13	7.75	16.00	---	1.50	7.92	11.91	0.80
lxxxix)	R100	749.30	28.58	19.81	35.10	---	2.30	17.48	30.18	2.30
xc)	R101	800.10	31.75	22.33	38.10	---	2.30	17.48	33.32	2.30
xc i)	R102	857.25	31.75	22.33	38.10	---	2.30	17.48	33.32	2.30
xc ii)	R103	914.40	31.75	22.33	38.10	---	2.30	17.48	33.32	2.30
xc iii)	R104	965.20	34.93	24.82	41.40	---	2.30	20.60	36.50	2.30
xc iv)	R105	1022.35	34.93	24.82	41.40	---	2.30	20.60	36.50	2.30

All dimensions are in mm unless otherwise specified.

NOTES

1 Variation in height (B) and (H) throughout the entire circumference of any given ring shall not exceed 0.20 mm within these tolerances.

2 Dimension "C" only for octagonal shape.

3 Tolerance of 23 degree angle, ± 0 degree 30 minutes (±0.50°).

Table 3 RX Type Gasket Dimensions and Tolerances
(Clause 7.1)

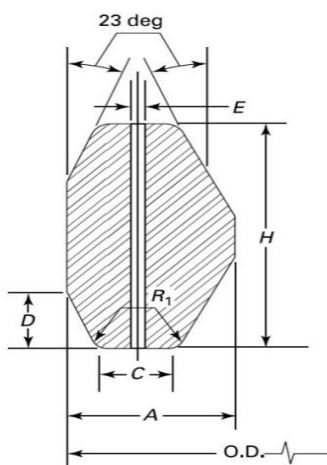


FIG. 2 RX TYPE RING GASKETS

Sl No.	Gasket Number	Outside Diameter	Width of Ring	Width of Flat	Height of OD Bevel	Height of Ring	Radius on Ring	Hole Size (Note 1)
		Ø OD	A*	C	D	H*	R ₁	E
		(+0.50/-0)	(+0.20/-0)	(+0.15/-0)	(+0/-0.76)	(+0.20/-0)	±0.50	±0.50
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	RX-20	76.20	8.74	4.62	3.18	19.05	1.50	---
ii)	RX-23	93.27	11.91	6.45	4.24	25.40	1.50	---
iii)	RX-24	105.97	11.91	6.45	4.24	25.40	1.50	---
iv)	RX-25	109.55	8.74	4.62	3.18	19.05	1.50	---
v)	RX-26	111.91	11.91	6.45	4.24	25.40	1.50	---
vi)	RX-27	118.26	11.91	6.45	4.24	25.40	1.50	---
vii)	RX-31	134.54	11.91	6.45	4.24	25.40	1.50	---
viii)	RX-35	147.24	11.91	6.45	4.24	25.40	1.50	---
ix)	RX-37	159.94	11.91	6.45	4.24	25.40	1.50	---
x)	RX-39	172.64	11.91	6.45	4.24	25.40	1.50	---
xi)	RX-41	191.69	11.91	6.45	4.24	25.40	1.50	---
xii)	RX-44	204.39	11.91	6.45	4.24	25.40	1.50	---
xiii)	RX-45	221.84	11.91	6.45	4.24	25.40	1.50	---
xiv)	RX-46	222.25	13.49	6.68	4.78	28.58	1.50	---
xv)	RX-47	245.26	19.84	10.34	6.88	41.28	2.30	---
xvi)	RX-49	280.59	11.91	6.45	4.24	25.40	1.50	---
xvii)	RX-50	283.36	16.66	8.51	5.28	31.75	1.50	---
xviii)	RX-53	334.57	11.91	6.45	4.24	25.40	1.50	---
xix)	RX-54	337.34	16.66	8.51	5.28	31.75	1.50	---
xx)	RX-57	391.72	11.91	6.45	4.24	25.40	1.50	---
xxi)	RX-63	441.73	27.00	14.78	8.46	50.80	2.30	---
xxii)	RX-65	480.62	11.91	6.45	4.24	25.40	1.50	---
xxiii)	RX-66	483.39	16.66	8.51	5.28	31.75	1.50	---
xxiv)	RX-69	544.12	11.91	6.45	4.24	25.40	1.50	---
xxv)	RX-70	550.06	19.84	10.34	6.88	41.28	2.30	---
xxvi)	RX-73	596.11	13.49	6.68	5.28	31.75	1.50	---
xxvii)	RX-74	600.86	19.84	10.34	6.88	41.28	2.30	---
xxviii)	RX-82	67.87	11.91	6.45	4.24	25.40	1.50	1.50
xxix)	RX-84	74.22	11.91	6.45	4.24	25.40	1.50	1.50
xxx)	RX-85	90.09	13.49	6.68	4.24	25.40	1.50	1.50
xxxi)	RX-86	103.58	15.09	8.51	4.78	28.58	1.50	2.30
xxxii)	RX-87	113.11	15.09	8.51	4.78	28.58	1.50	2.30
xxxiii)	RX-88	139.29	17.48	10.34	5.28	31.75	1.50	3.00
xxxiv)	RX-89	129.77	18.26	10.34	5.28	31.75	1.50	3.00
xxxv)	RX-90	174.63	19.84	12.17	7.42	44.45	2.30	3.00
xxxvi)	RX-91	286.94	30.18	19.81	7.54	45.24	2.30	3.00
xxxvii)	RX-99	245.67	11.91	6.45	4.24	25.40	1.50	---
xxxviii)	RX-201	51.46	5.74	3.20	1.45	11.30	0.50 (Note 2)	---
xxxix)	RX-205	62.31	5.56	3.05	1.83 (Note 3)	11.10	0.50 (Note 2)	---
xl)	RX-210	97.64	9.53	5.41	3.18 (Note 3)	19.05	0.80 (Note 2)	---
xli)	RX-215	140.89	11.91	5.33	4.24 (Note 3)	25.40	1.50 (Note 2)	---

SI No.	Gasket Number	Outside Diameter Ø OD	Width of Ring A*	Width of Flat C	Height of OD Bevel D	Height of Ring H*	Radius on Ring R ₁	Hole Size (Note 1) E
		(+0.50/-0)	(+0.20/-0)	(+0.15/-0)	(+0/-0.76)	(+0.20/-0)	±0.50	±0.50
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

All dimensions are in mm unless otherwise specified.

* The variation in width A or height H throughout the entire circumference of any ring shall not exceed 0.10 mm within these tolerances.

NOTES

1 Rings RX-82 through RX-91 require only one pressure passage hole as illustrated. The centreline of the hole shall be located at the midpoint of dimension "C".

2 Tolerance of 23 degree angle, ± 0 degree 15 minutes (±0.25°).

Table 4 BX Type Gasket Dimensions and Tolerances
(Clauses 7.1, 8.2.2, and 8.2.4)

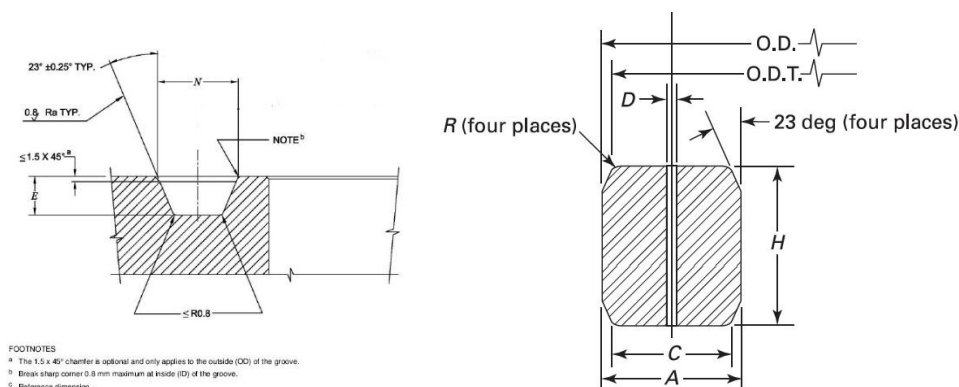


FIG. 3 BX TYPE RING GASKETS

SI No.	Ring Number	Ø OD	Diameter of flat Ø ODT	Width A*	Width of flat C	Height H*	Hole size D
		(0.0 / -0.15)	±0.05	(+0.20/-0.0)	(+0.15/-0.0)	(+0.20/-0.00)	±0.50
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	BX 150	72.19	70.87	9.30	7.98	9.30	1.50
ii)	BX 151	76.40	75.03	9.63	8.26	9.63	1.50
iii)	BX 152	84.68	83.24	10.24	8.79	10.24	1.50
iv)	BX 153	100.94	99.31	11.38	9.78	11.38	1.50
v)	BX 154	116.84	115.09	12.40	10.64	12.40	1.50
vi)	BX 155	147.96	145.95	14.22	12.22	14.22	1.50
vii)	BX 156	237.92	235.28	18.62	15.98	18.62	3.00
viii)	BX 157	294.46	291.49	20.98	18.01	20.98	3.00
ix)	BX 158	352.04	348.77	23.14	19.86	23.14	3.00
x)	BX 159	426.72	423.09	25.70	22.07	25.70	3.00
xi)	BX 160	402.59	399.21	13.74	10.36	23.83	3.00
xii)	BX 161	491.41	487.45	16.21	12.24	28.07	3.00
xiii)	BX 162	475.49	473.48	14.22	12.22	14.22	1.50

SI No.	Ring Number	Ø OD	Diameter of flat	Width	Width of flat	Height	Hole size
		(0.0 /-0.15)	Ø ODT	A*	C	H*	D
			±0.05	(+0.20/-0.0)	(+0.15/-0.0)	(+0.20/-0.00)	±0.50
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
xiv)	BX 163	556.16	551.89	17.37	13.11	30.10	3.00
xv)	BX 164	570.56	566.29	24.59	20.32	30.10	3.00
xvi)	BX 165	624.71	620.19	18.49	13.97	32.03	3.00
xvii)	BX 166	640.03	635.51	26.14	21.62	32.03	3.00
xviii)	BX 167	759.36	754.28	13.11	8.03	35.87	1.50
xix)	BX 168	765.25	760.17	16.05	10.97	35.87	1.50
xx)	BX 169	173.51	171.27	12.93	10.69	15.85	1.50
xxi)	BX 170	218.03	216.03	14.22	12.22	14.22	1.50
xxii)	BX 171	267.44	265.43	14.22	12.22	14.22	1.50
xxiii)	BX 172	333.07	331.06	14.22	12.22	14.22	1.50
xxiv)	BX 303	852.75	847.37	16.97	11.61	37.95	1.50

All dimensions are in mm unless otherwise specified.

* The variation in width A or height H of any ring does not exceed 0.10 mm throughout its entire circumference.

NOTES

1 Radius "R" shall be 8 to 12 percent of the gasket height.

2 Tolerance of 23 degree angle, ± 0 degree 15 minutes (±0.25°).

Table 5 SBX Type Gaskets Dimensions
(Clause 7.1)

SI No.	Ring Number	OD	Diameter of Flat	Width	Width of Flat	Height	Hole Size
		(+0/- 0.15)	Ø ODT	A*	C	H*	D
			±0.05	(+0.20/-0)	(+0.15/-0)	(+0.20/-0)	±0.50
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	SBX 149	42.64	41.32	7.51	6.12	9.62	1.50
ii)	SBX 150	72.19	70.87	9.30	7.98	9.30	1.50
iii)	SBX 151	76.40	75.03	9.63	8.26	9.63	1.50
iv)	SBX 152	84.68	83.24	10.24	8.79	10.24	1.50
v)	SBX 153	100.94	99.31	11.38	9.78	11.38	1.50
vi)	SBX 154	116.84	115.09	12.40	10.64	12.40	1.50
vii)	SBX 155	147.96	145.95	14.22	12.22	14.22	1.50
viii)	SBX 156	237.92	235.28	18.62	15.98	18.62	3.00
ix)	SBX 157	294.46	291.49	20.98	18.01	20.98	3.00
x)	SBX 158	352.04	348.77	23.14	19.86	23.14	3.00
xi)	SBX 159	426.72	423.09	25.70	22.07	25.70	3.00
xii)	SBX 160	402.59	399.21	13.74	10.36	23.83	3.00
xiii)	SBX 161	491.41	487.45	16.21	12.24	28.07	3.00
xiv)	SBX 162	475.49	473.48	14.22	12.22	14.22	1.50
xv)	SBX 163	556.16	551.89	17.37	13.11	30.10	3.00
xvi)	SBX 164	570.56	566.29	24.59	20.32	30.10	3.00
xvii)	SBX 165	624.71	620.19	18.49	13.97	32.03	3.00

xviii)	SBX 166	640.03	635.51	26.14	21.62	32.03	3.00
xix)	SBX 169	173.51	171.29	12.93	10.69	15.85	1.50

NOTES

1 A plus tolerance of 0.20 mm for width (A) and height (H) is permitted, provided the variation in width or height of any ring does not exceed 0.10 mm throughout its entire circumference.

2 Radius (R) shall be 8 percent to 12 percent of the gasket height (H). (Tolerance of R: +0.50 mm)

7.2 Flatness of the Gasket

Ring gasket shall be flat within a tolerance of 0.2 percent of ring outside diameter to a maximum of 0.38 mm.

7.3 Surface Finish

7.3.1 For oval, R ring type gaskets, the surface finish shall be no rougher than 1.6 μm R_a (63 $\mu\text{in. RMS}$) on the radius surfaces.

7.3.2 For octagonal, R and RX ring type gaskets, all 23° surfaces shall have a surface finish no rougher than 1.6 μm R_a (63 $\mu\text{in. RMS}$).

7.3.3 All 23° surfaces on BX and SBX ring type gaskets shall have a surface finish no rougher than 0.8 μm R_a (32 $\mu\text{in. RMS}$).

8 INSPECTION AND TESTING

8.1 Dimensional Inspection

8.1.1 Sampling — Sampling for dimensional inspection of R and RX ring type gaskets shall be followed in accordance with Table 1 for level II of IS 2500 (Part 1)/ ISO 2859-1.

8.1.2 Dimensional inspection for all ring gaskets R and RX shall be performed by following the Tables 3 and 4 in this specification.

8.2 Special Requirement for the Inspection of BX Ring Gaskets

8.2.1 Sampling of BX Ring Type Gaskets

Sampling for dimensional inspection of BX ring type gaskets shall be followed as below:

- a) BX156 and smaller and BX169 and BX170 Gaskets shall be in accordance with Table 1 for level II of IS 2500 (Part 1)/ ISO 2859-1; and
- b) BX157 through BX303 (excluding BX169 and BX170) in accordance with Table 1 for level III of IS 2500 (Part 1)/ ISO 2859-1.

8.2.2 Dimension

Dimensional inspection for BX ring type gaskets in the finished condition shall be performed by following the Table 4 in this specification.

8.2.3 Inspection

The BX gasket shall be inspected according to the following method to determine the percentage difference:

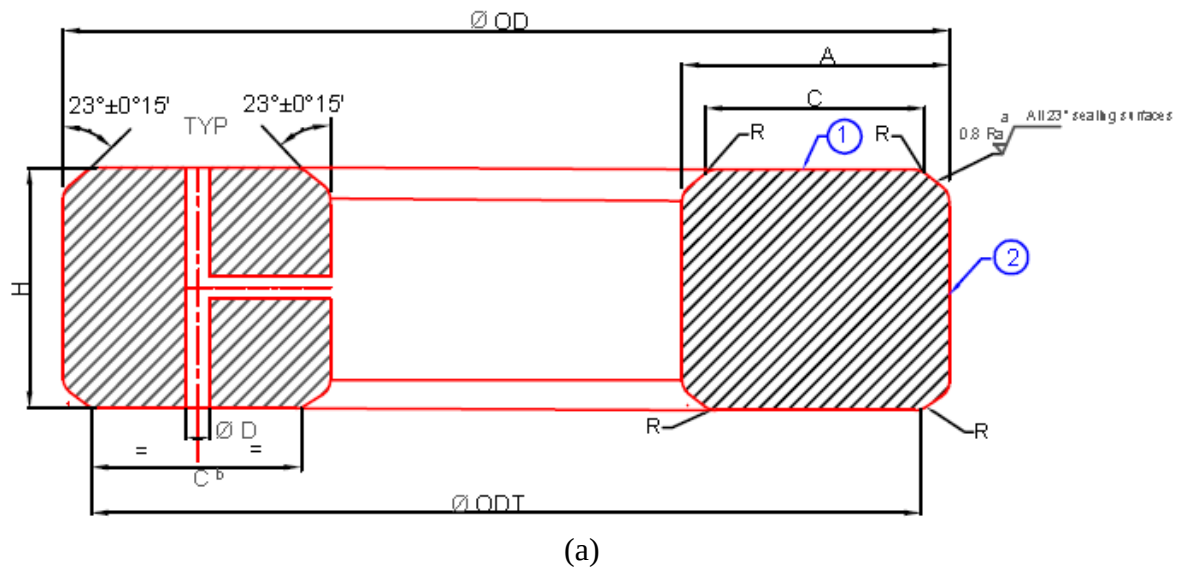
- a) At a minimum of four equidistant locations the ring width (A) and ring height (H) shall be measured;
- b) At a minimum of four equidistant locations the outer ring diameter shall be measured;
- c) Nominal OD (average reading) shall be calculated from the measured OD at 4 locations;
- d) The maximum ovality in OD (from the maximum and minimum readings) shall be calculated; and
- e) The percentage difference based on the nominal ring diameter shall be determined.

8.2.4 Acceptance Criteria for BX Gasket

The following shall be the acceptance criteria:

- a) The difference in width (A) or height (H) between any two measured locations shall not exceed 0.10 mm;
- b) The average OD shall be within the tolerance specified in Table 4; and
- c) In the OD out of round shall not exceed 0.2 percent of the nominal ring outside diameter.

8.3 Special Requirement for SBX Ring Type Gaskets



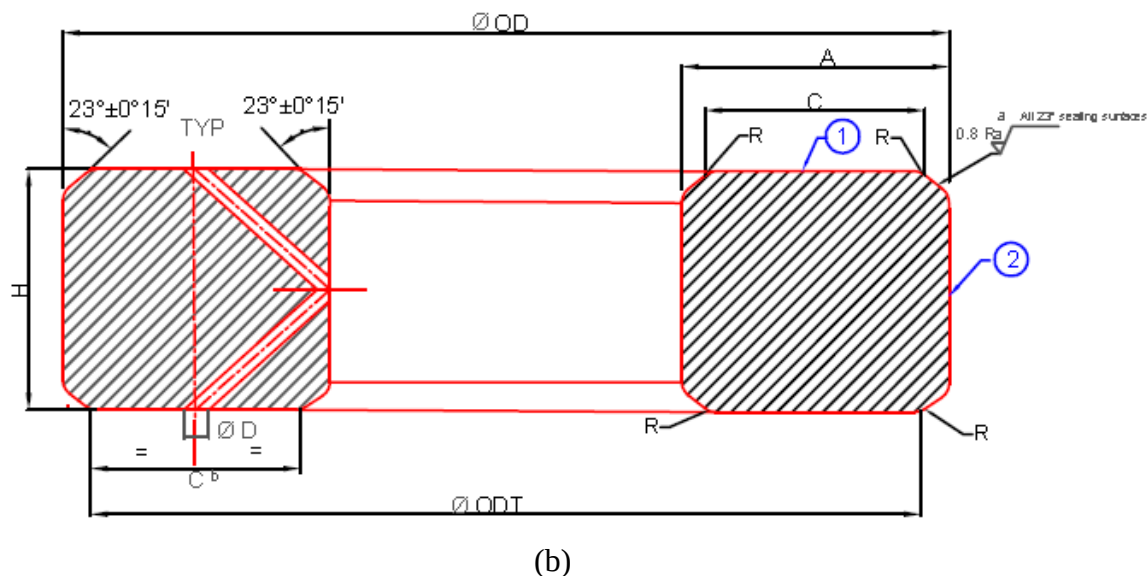


FIG. 4 SBX TYPE RING JOINT GASKETS

8.3.1 Flanges for SBX Gasket

8.3.1.1 Only SBX gaskets shall be used for subsea operating equipment and for underwater services.

8.3.1.2 SBX gaskets with vented types shall be used in type's 6BX, 17SS, and 17SV flanges.

8.3.2 Design

8.3.2.1 SBX gaskets will be as shown in the Fig. 4 with vent holes with 2 types. Manufacturer shall establish any one of this type and if required buyer approval may be obtained.

8.3.3 Gasket Material

Gasket material shall be of a corrosion-resistant alloy (CRA) or corrosion-resistant material (CRM) to provide corrosion resistance to seawater under the specified operating conditions (dissimilar metal corrosion with the ring groove).

9 HARDNESS TESTING

9.1 Sampling

Sampling shall be performed on completed ring gaskets in accordance with Table 1 for level II of IS 2500 (Part 1)/ ISO 2859-1.

9.2 Testing

The location of the hardness test for ring gaskets shall be in accordance with Fig. 5.

The hardness test shall be carried out in accordance with IS 1500 (Part 1)/ ISO 6506-1 and IS 1586 (Part 1)/ ISO 6508-1 as applicable.

Bend test, if required, shall be carried out in accordance with IS 1599/ ISO 7438.

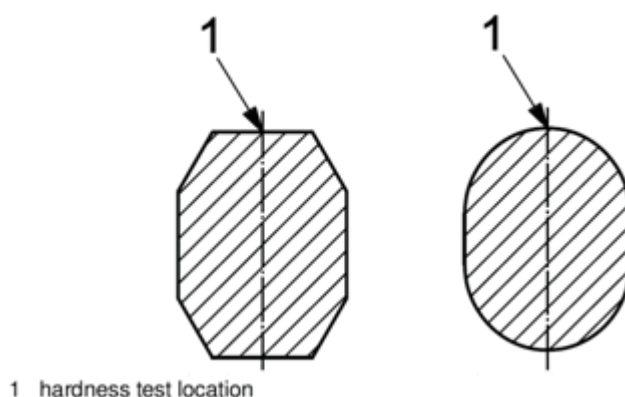


Fig. 5 HARDNESS TEST LOCATION

9.3 Hardness Requirement

Ring type joint gaskets shall be produced from the material to suit to the operating conditions.

Ring type joint gaskets produced from the following materials shall conform to the hardness as indicated in Table 1.

10 IDENTIFICATION MARKING

The outer surface of each gasket shall carry the ring gasket type and identification mark.

Example:

BX155 and Gasket material identification.

SBX155-304 for type 304 steel.

Material shall be identified as per Table 6.

Table 6 Marking of Ring Type Joint Gaskets
(Clause 10)

Sl No.	Material	Marking Code	Marking Example
(1)	(2)	(3)	(4)
i)	Soft iron	D	R67D
ii)	Low carbon steel	S	R67S
iii)	4-6% Cr 0.5% Mo steel	F5	R67F5
iv)	Type 304 steel	S304	R67S304
v)	Type 316 steel	S316	R67S316
vi)	Type 347 steel	S347	R67S347
vii)	Type 410 steel	S410	R67S410

viii)	Other materials	UNS Number
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11 COATINGS AND PLATINGS

11.1 Coating and plating may be employed as per customer requirement to aid the seal engagement while minimizing galling and to extend shelf life.

11.2 Coating and plating thicknesses shall be 0.013 mm (13 microns) maximum.

12 STORING AND SHIPPING

Loose ring gaskets shall be boxed or wrapped during shipping and storage.

13 RE-USE

Ring gaskets have a limited amount of positive interference, which ensures that the gaskets are coined into a sealing relationship in the grooves and therefore gaskets shall not be reused except for testing purposes.

14 MARKING

14.1 Marking of SBX Ring Joint gaskets shall be on the outside diameter of gasket as described below:

- a) Date of manufacture;
- b) Manufacturers name or trademark and address;
- c) Ring gasket type (R, RX, BX, or SBX) and number; and
- d) Ring gasket material marking code per the Table 6.

14.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.