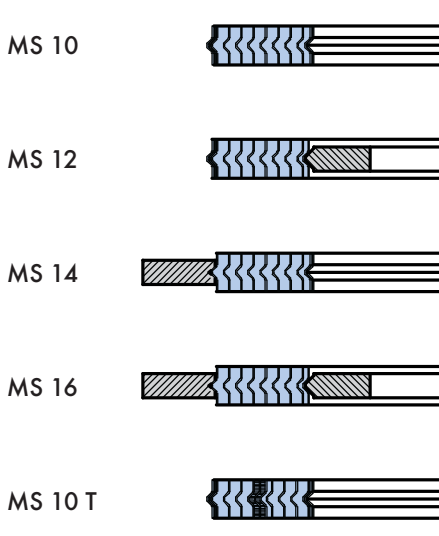


1. SPIRAL WOUND GASKETS

PROPERTIES AND APPLICATION

Spiral wound gaskets are special semi-metallic gaskets of great resilience, therefore they are very suitable for applications featuring heavy operating conditions. Spiral wound gaskets are manufactured by spirally winding a V-shaped metal strip and a strip of non-metallic filler material. The metal strip holds the filler, providing the gasket with mechanical resistance and resilience. Spiral wound gaskets can be reinforced by an outer centering ring and/or inner retaining ring. The outer centering ring controls the compression and holds the gasket centrally within the bolt circle. The inner retaining ring increases the axial rigidity and resilience of the gasket. Spiral wound gaskets should always be in contact with the flange and should not protrude into the pipe or project from the flange. Spiral wound gaskets can be used for sealing flange joints, manhole and handhold covers, tube covers, boilers, heat exchangers, pressure vessels, pumps, compressors and valves; in industries such as petrochemical, pharmaceutical, shipbuilding, and food processing, in power industries and nuclear power stations. They are ideal for steam, oil, liquids, gases, acids, alkalines, various organic mediums and solvents.



ADVANTAGES

- Sealing under heavy operating conditions.
- Strong stress compensation, stable and reliable sealing performance even under frequent pressure fluctuation condition.
- Solid construction provides stability and sealability even when the sealing surfaces are slightly corroded or bent.
- Easy installation.

SHAPE AND CONSTRUCTION

Spiral wound gaskets are produced in several styles and combination of materials to fit the most stringent application. Spiral wound gaskets are usually of circular shape, however we can produce them in other shapes such as: oval, rectangular, with round corners, etc. Our standard production program comprises a range of spiral wound gaskets with inner diameters of 10 mm to 3000 mm and a nominal thickness of 3.2 mm, 4.5 mm and 6.5 mm. Spiral wound gaskets of non-standard dimensions and shapes, and larger diameters are available on request.

Gasket standard styles:

- Gaskets without guide and inner ring (Type MS 10)
- Gaskets without guide and inner ring (Type MS 10T)*
- Gaskets with inner ring (Type MS 12)
- Gaskets with guide (outer) ring (Type MS 14)
- Gaskets with guide and with inner ring (Type MS 16)

* With PTFE sealing zone

1. SPIRAL WOUND GASKETS

Metallic strip

Standard thickness of the metallic strip is 0.2 mm (0.18).

MATERIALS FOR METALLIC STRIP	
ASTM	DIN Material No.
AISI 304	1.4301
AISI 316, 316 L	1.4401, 1.4404
AISI 321	1.4541
AISI 316 Ti	1.4571
Monel (NiCu30Fe)	2.4360

Other alloys available on request.

Filler

Filler is normally used for thicknesses from 0.5 mm to 0.6 mm.

- Flexible graphite 98%
- Flexible graphite 99.85%
- PTFE, EPTFE
- Ceramic, Micalit

Centering ring

The centering ring does not come into direct contact with contained fluid. It is normally made of carbon steel and electro plated or painted to avoid corrosion. Other materials are available on request.

Inner ring

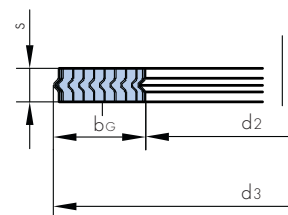
Inner ring is used to avoid excessive compression due to high seating stress in high-pressure service and it is also used to reduce turbulence in the flange area. It is normally made of the same material as the gasket metallic strip.

DIMENSIONS

Manufacturing sizes

This limitations are general and can vary according to the special customer requirements.

LIMITATIONS FOR MANUFACTURING DIMENSIONS			
Thickness [mm]	Max diameter d_3 [mm]	Maximum width - b_G [mm]	
		Graphite	PTFE
2.5	300	16	13
3.2	700	22	19
4.5	1500	30	24
6.5	3000	35	24
7.2	3000	30	24



Thickness

The standard manufacturing thicknesses for spiral wound gaskets are: 3.2 mm; 4.5 mm; 6.5 mm (measured across metallic strip not including the filler, which protrudes 0.2 - 0.3 mm beyond the metal).

Manufacturing tolerances

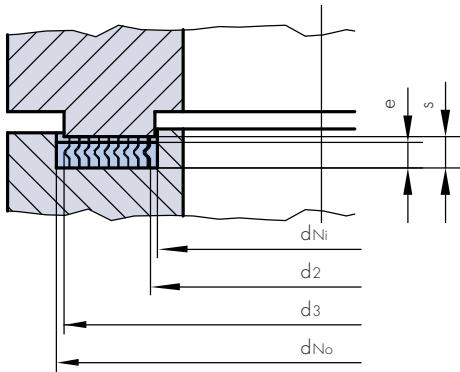
The tolerance of the gasket diameters (d_1 , d_2 , d_3 , d_4 , s , s_1) are stipulated by ASME B 16.20 and EN 1514-2 standards. The gaskets designed for non-standard flanges meet the recommendations by the ASME B 16.20.

Dimensions

The dimensions of the standard SWG meet the ASME, BS and EN (DIN) standards.

1. SPIRAL WOUND GASKETS

LOAD BEARING GASKETS



Gasket compression

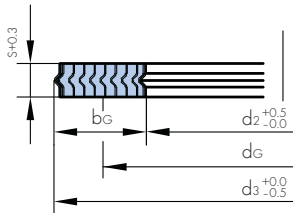
Spiral-wound gaskets shall be designed in such a way that a uniform bolt stress, based on the nominal root diameter, will compress the gasket to a thickness (e).

STANDARD GASKET COMPRESSION			
s	3.2	4.5	6.5
e	2.5 ^{+0.1}	3.3 ^{+0.1}	4.7 ^{+0.1}

Connections with non-load bearing gaskets

Since no standards exist as yet for the use of spiral-wound gaskets in no-load bearing connections, the application of guidelines from the adjacent table is recommended.

Gaskets and grooves dimensions



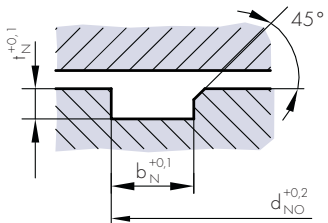
SPIRAL-WOUND GASKET				GROOVE				
d _M	s	b _G	d ₃	d ₂	d _{NO}	b _N	d _{NI}	t _N
< 300	3.2	5-9	d _G + b _G	d _G - b _G	d ₃ + 1	b _G / 0.86	d _{NO} - 2b _N	2.5 ^{+0.1}
< 1000	3.2	9-17	d _G + b _G	d _G - b _G	d ₃ + 1.5		d _{NO} - 2b _N	2.5 ^{+0.1}
< 300	4.5	5-9	d _G + b _G	d _G - b _G	d ₃ + 1		d _{NO} - 2b _N	3.3 ^{+0.1}
< 1000	4.5	9-17	d _G + b _G	d _G - b _G	d ₃ + 1.5		d _{NO} - 2b _N	3.3 ^{+0.1}

b_G-gasket width

b_N-groove width

Tolerance Table

FLANGE SIZE		PROJECTION AND RECESS			SMOOTH CONTACT FACE					
NPS (in)	DN (mm)	d2	d3	s1	d1	d2	d3	d4	s1	s2
< 10"	< 300	±0.5	±0.5	+0.8 +0.1	±0.8	±0.8	±0.8	±0.8	+0.8 +0.1	+0.25 -0.15
10" - 24"	300 - 700	±0.8	±0.8	+0.8 +0.1	±0.8	±0.8	±0.8	+0.8 -1.6	+0.8 +0.1	+0.25 -0.15
26" - 50"	800 - 1200	±1.2	±1.2	+0.8 +0.1	±1.6	±1.6	±1.6	+0.8 -2.0	+0.8 +0.1	+0.25 -0.15
> 50"	> 1200				±2.4	±2.4	±2.4	+0.8 -3.0	+0.8 +0.1	+0.25 -0.15



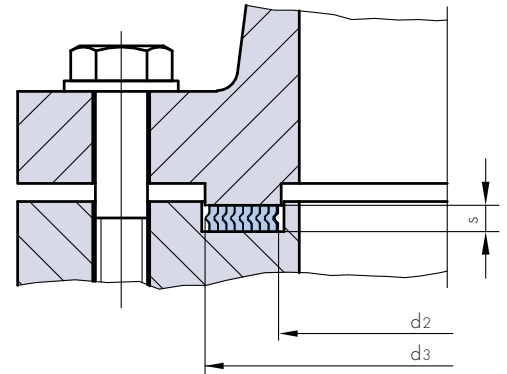
Gasket parameters

Gasket Type	MATERIAL (Jacket)	DIN 2505		ASME	
		k ₁ [mm]	k ₀ xk _D [N/mm]	m	y [MPa]
MS 10, MS 12, MS 14, MS 16	Steel, Cr-Steel	1.3x _{BD}	50x _{BD}	1.3	50
	CrNi-Steel, Monel	1.4x _{BD}	55x _{BD}	1.4	55
	CrNi-Steel (Graphite/PTFE)	1.2x _{BD}	40x _{BD}	1.2	40

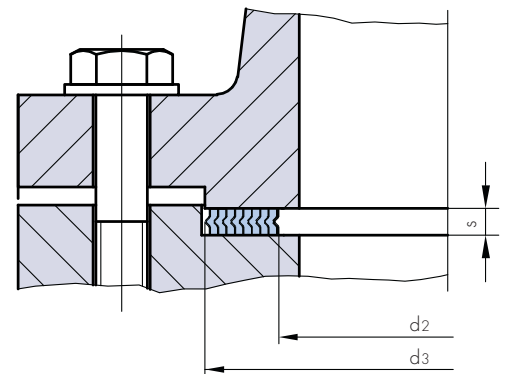
1. SPIRAL WOUND GASKETS

All standard and non-standard types can be delivered in non-standard dimensions according to customer request.

EN 1092 and ASME B 16.5 TONGUE and GROOVE flanges meet SWG dimensions according to ASME B 16.21 or other customer request.



EN 1092 and ASME B 16.5 MALE and FEMALE flanges meet SWG dimensions according to ASME B 16.21 or other customer request.



NON-STANDARD SWG

Gaskets for Boilers Handholes and Manholes:

Gaskets Type MS 10 can be manufactured in other shapes like oval and oblong (stadium). There is no specific standard for this type of gasket. When ordering it providing complete specifications is required: inside dimensions (AxB), width (b) and thickness (s) or a drawing.

GASKET ORDERING EXAMPLE

Spiral wound gasket MS 10,

A x B x b x s,

Winding: AISI 316,

Filler: Graphite 98%

Spiral wound gasket MS 16,

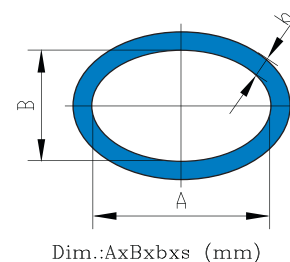
ASME B 16.20 for ASME B 16.5, 2"-150lbs,

Winding, inner ring: AISI 316,

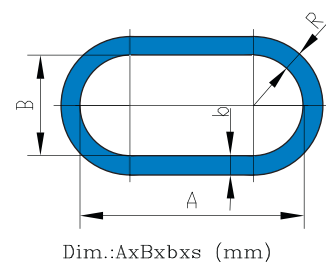
Filler: Graphite 98%,

Centering ring: CS

Oval shape



Oblong (stadium) shape

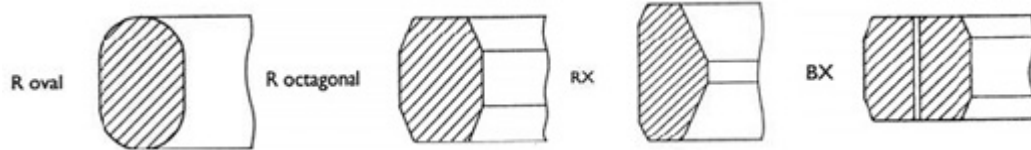


RING JOINT GASKET

Machined from solid metals in a variety of shapes and are designed for high pressure, high temperature or highly corrosive applications by selecting the most suitable material and shapes.



Models



Section Type:

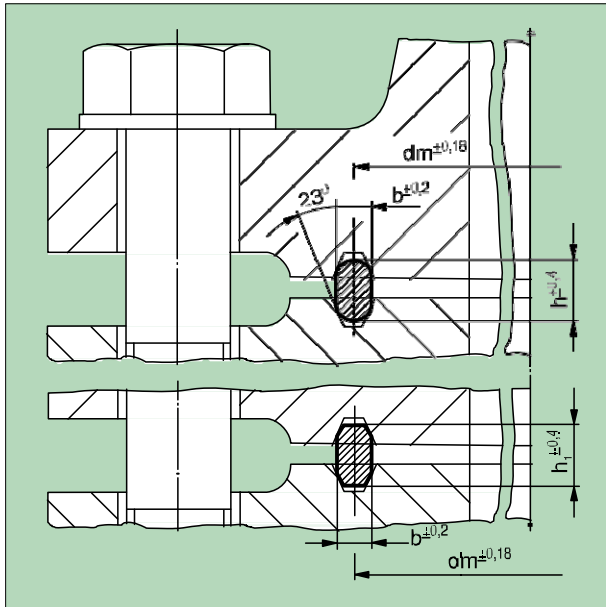
Type	Pressure Mpa
Oval	70
Octagonal	70
Rx	70
Bx	150

Material:

Material	Identification	Max, Hard	Temperature(°C)
Soft Iron	D	90	540
Low Carbon Steel	S	120	540
5Cr0.5Mo	A182-F5	130	650
SS304	SS304	160	800
SS316	SS316	160	800
SS316L	SS316L	150	800

Ring-Joint Gaskets, Type R

Ring-joint gaskets, type R, dimensions according to ASME B16.20, API Std 6 A for flanges to ASME B16.5 and ASME B16.47, series A



Order example for an oval ring-joint gasket, profile A11, nominal pipe size 5 inches, class 150, made of...1):

Ring-joint gasket R 40 A11/1.4541

Order example for an octagonal ring-joint gasket, profile A13, nominal pipe size 20 inches, class 1500, made of...1):

Ring-joint gasket R 75 A13/1.4541

Dimensions in mm							
NPS	class	Ring no.	Ring dimensions				
			dm	b	h	h ₁	
1/2	300 to 600	R 11	34,13	6,35	11,11	9,52	
	900, 1 500	R 12	39,68	7,93	14,28	12,7	
	2500	R 13	42,86	7,93	14,28	12,7	
3/4	300 to 600	R 13	42,86	7,93	14,28	12,7	
	900, 1500	R 14	44,45	7,93	14,28	12,7	
	150	R 15	47,62	7,93	14,28	12,7	
1	2500	R 16	50,8	7,93	14,28	12,7	
	300 to 1500	R 16	50,8	7,93	14,28	12,7	
	150	R 17	57,15	7,93	14,28	12,7	
1 1/4	2500	R 18	60,32	7,93	14,28	12,7	
	300 to 1500	R 18	60,32	7,93	14,28	12,7	
	150	R 19	65,08	7,93	14,28	12,7	
1 1/2	300 to 1500	*R 20	68,26	7,93	14,28	12,7	
	2500	R 21	72,23	11,11	17,46	15,87	
	150	R 22	82,55	7,93	14,28	12,7	
2	2500	*R 23	82,55	11,11	17,46	15,87	
	300 to 600	*R 23	82,55	11,11	17,46	15,87	
	900, 1500	*R 24	95,25	11,11	17,46	15,87	
2 1/2	150	R 25	101,6	7,93	14,28	12,7	
	2500	*R 26	101,6	11,11	17,46	15,87	
	300 to 600	*R 26	101,6	11,11	17,46	15,97	
3	900, 1500	*R 27	107,95	11,11	17,46	15,87	
	2500	R 28	111,12	12,7	19,05	17,46	
	150	R 29	114,3	7,93	14,28	12,7	

* These rings comply with API standard 6 A. The dimensions specified in mm are converted dimensions and deviate slightly from the metric API table.

- 1) State material with order
- 2) Ring for flange as per ASME B16.47, series A

Dimensions in mm							
NPS	class	Ring no.	Ring dimensions				
			dm	b	h	h ₁	
3	300 to 600	*R 30	117,47	11,11	17,46	15,87	
	300 to 900	*R 31	123,82	11,11	17,46	15,87	
	2500	R 32	127,0	12,7	19,05	17,46	
3 / 3	150	R 33	131,76	7,93	14,28	12,7	
	300 to 600	R 34	131,76	11,11	17,46	15,87	
	1500	*R 35	136,52	11,11	17,46	15,87	
4	150	R 36	149,22	7,93	14,28	12,7	
	300 to 900	*R 37	149,22	11,11	17,46	15,87	
	2500	R 38	157,16	15,87	22,22	20,64	
4	1500	*R 39	161,92	11,11	17,46	15,87	
	150	R 40	171,45	7,93	14,28	12,7	
	300 to 900	*R 41	180,97	11,11	17,46	15,87	
5	2500	R 42	190,5	19,05	25,4	23,81	
	150	R 43	193,67	7,93	14,28	12,7	
	1500	*R 44	193,67	11,11	17,46	15,87	
6	300 to 900	*R 45	211,13	11,11	17,46	15,87	
	150	*R 46	211,13	12,7	19,05	17,46	
	2500	*R 47	228,6	19,05	25,4	23,81	
8	150	R 48	247,65	7,93	14,28	12,7	
	300 to 900	*R 49	269,87	11,11	17,46	15,87	
	1500	*R 50	269,87	15,87	22,22	20,64	
8	2500	R 51	279,4	22,22	28,57	26,99	
	150	R 52	304,8	7,93	14,28	12,7	
	300 to 900	*R 53	323,85	11,11	17,46	15,87	
10	1500	*R 54	323,85	15,87	22,22	20,64	
	2500	R 55	342,9	28,57	36,51	34,92	
	150	R 56	381,0	7,93	14,28	12,7	
12	300 to 900	*R 57	381,0	11,11	17,46	15,87	
	1500	R 58	381,0	22,22	28,57	26,99	
	150	R 59	396,87	7,93	14,28	12,7	
12	2500	R 60	406,4	31,75	39,68	38,1	
	300 to 600	R 61	419,1	11,11	17,46	15,87	
	900	R 62	419,1	15,87	22,22	20,64	
14	1500	*R 63	419,1	25,4	33,33	31,75	
	150	R 64	454,0	7,93	14,28	12,7	
	300 to 600	*R 65	469,9	11,11	17,46	15,87	
16	900	*R 66	469,9	15,87	22,22	20,64	
	1500	R 67	469,9	28,57	36,51	34,92	
	150	R 68	517,52	7,93	14,28	12,7	
18	300 to 600	*R 69	533,4	11,11	17,46	15,87	
	900	*R 70	533,4	19,05	25,4	23,81	
	1500	R 71	533,4	28,57	36,51	34,92	
20	150	R 72	558,8	7,93	14,28	12,7	
	300 to 600	*R 73	584,2	12,7	19,05	17,46	
	900	*R 74	584,2	19,05	25,4	23,81	
20	1500	R 75	584,2	31,75	39,68	38,1	
	150	R 76	673,1	7,93	14,28	12,7	
	300 to 600	R 77	692,15	15,87	22,22	20,64	
24	900	R 78	692,15	25,4	33,33	31,75	
	1500	R 79	692,15	34,92	44,45	41,27	
	150	R 80	615,95	7,93	14,28	12,7	
22	300 to 600	R 81	635,0	14,28	17,46	15,87	
	10000	*R 82	57,15	11,11	17,46	15,87	
	10000	*R 84	63,5	11,11	17,46	15,87	
2	10000	*R 85	79,37	12,7	17,46	15,87	
	10000	*R 86	90,49	15,87	20,63	19,05	
	10000	*R 87	100,01	15,87	20,63	19,05	
4	10000	*R 88	123,83	19,05	23,81	22,22	
	10000	*R 89	114,3	19,05	23,81	22,22	
	10000	*R 90	155,58	22,22	26,98	25,4	
10	10000	*R 91	260,35	31,75	38,1	36,51	
	10000	R 92	228,6	11,11	17,46	15,87	
	10000	R 93 ²⁾	749,3	19,05	23,81	22,22	
28	300, 400, 600	R 94 ²⁾	800,1	19,05	23,81	22,22	
	300, 400, 600	R 95 ²⁾	857,25	19,05	23,81	22,22	
	300, 400, 600	R 96 ²⁾	914,4	22,22	26,98	25,4	
34	300, 400, 600	R 97 ²⁾	965,2	22,22	26,98	25,4	
	300, 400, 600	R 98 ²⁾	1022,35	22,22	26,98	25,4	
	2000, 3000	*R 99	234,95	11,11	17,46	15,87	
26	900	R 100 ²⁾	749,3	28,57	34,92	33,33	
	900	R 101 ²⁾	800,1	31,75	38,1	36,51	
	900	R 102 ²⁾	857,25	31,75	38,1	36,51	
32	900	R 103 ²⁾	914,4	31,75	38,1	36,51	
	900	R 104 ²⁾	965,2	34,92	41,27	39,68	
	900	R 105 ²⁾	1022,35	34,92	41,27	39,68	

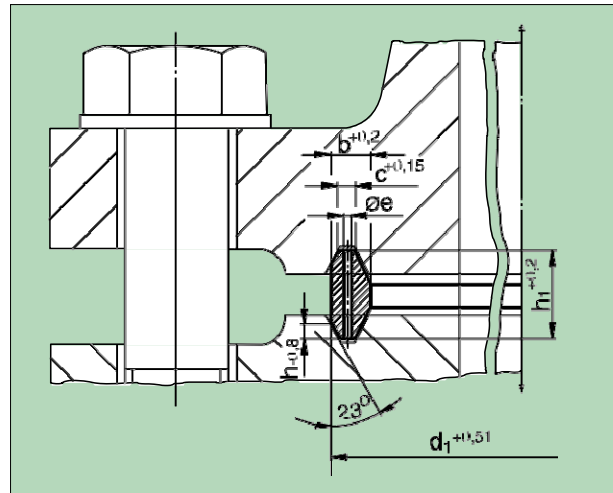
Ring-Joint Gaskets, Type RX

Ring-joint gasket, type RX, dimensions according to ASME B16.20 and/or API Std 6 A for API 6B flanges

Order example for a ring-joint gasket, profile A14, nominal pipe size 5 inches, class 3000, made of...¹⁾:

Ring-joint gasket RX 37 A14/1.4541

1) State material with order

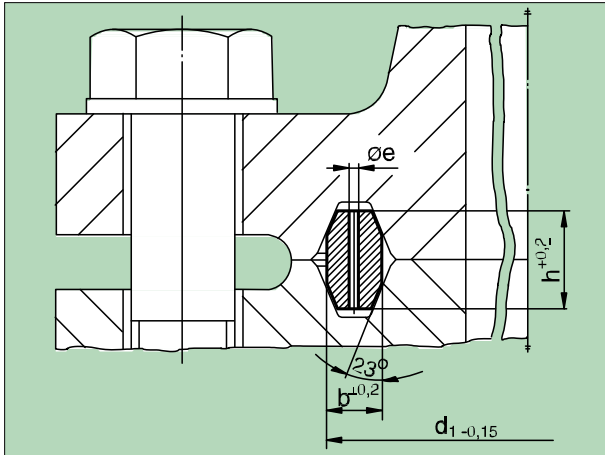


Dimensions in mm								
NPS	class	Ring no.	Ring dimensions					1* drilled hole e
			d ₁	b	c	h ₁	h	
1 1/2	2000, 3000, 5000	RX 20	76,2	8,73	4,62	19,05	3,18	
2	2000	RX 23	93,27	11,91	6,45	25,4	4,24	
2	3000, 5000	RX 24	105,97	11,91	6,45	25,4	4,24	
3 1/8	5000	RX 25	109,54	8,73	4,62	19,05	3,18	
2 1/2	2000	RX 26	111,92	11,91	6,45	25,4	3,78	
2 1/2	3000, 5000	RX 27	118,27	11,91	6,45	25,4	4,24	
3	2000, 3000	RX 31	134,54	11,91	6,45	25,4	4,24	
3	5000	RX 35	147,24	11,91	6,45	25,4	4,24	
4	2000, 3000	RX 37	159,94	11,91	6,45	25,4	4,24	
4	5000	RX 39	172,64	11,91	6,45	25,4	4,24	
5	2000, 3000	RX 41	191,69	11,91	6,45	25,4	4,24	
5	5000	RX 44	204,39	11,91	6,45	25,4	4,24	
6	2000, 3000	RX 45	221,85	11,91	6,45	25,4	4,24	
6	5000	RX 46	222,25	13,49	6,68	28,58	4,78	
8	crossover flange	RX 47	245,3	19,84	10,34	41,28	6,88	
8	2000, 3000	RX 49	280,59	11,91	6,45	25,4	4,24	
8	5000	RX 50	283,37	16,67	8,51	31,75	5,28	
10	2000, 3000	RX 53	334,57	11,91	6,45	25,4	4,24	
10	5000	RX 54	337,34	16,67	8,51	31,75	5,28	
12	2000, 3000	RX 57	391,72	11,91	6,45	25,4	4,24	
14	5000	RX 63	441,72	26,99	14,78	50,8	8,46	
16	2000	RX 65	480,62	11,91	6,45	25,4	4,24	
16	3000	RX 66	483,39	16,67	8,51	31,75	5,28	
18	2000	RX 69	544,1	11,91	6,45	25,4	4,24	
18	3000	RX 70	550,1	19,84	10,34	41,28	6,88	
20	2000	RX 73	596,1	13,49	6,68	31,75	5,28	
20	3000	RX 74	600,87	19,84	10,34	41,28	6,88	
		RX 82	67,87	11,91	6,45	25,4	4,24	1,6
		RX 84	74,22	11,91	6,45	25,4	4,24	1,6
		RX 85	90,09	13,49	6,68	25,4	4,24	1,6
		RX 86	103,58	15,08	8,51	28,58	4,78	2,4
		RX 87	113,1	15,08	8,51	28,58	4,78	2,4
		RX 88	139,3	17,46	10,34	31,75	5,28	3,2
		RX 89	129,78	18,26	10,34	31,75	5,28	3,2
		RX 90	174,62	19,84	12,17	44,45	7,42	3,2
		RX 91	286,94	30,16	19,81	45,24	7,54	3,2
		RX 99	245,67	11,91	6,45	25,4	4,24	
1 1/4	5000	RX 201	51,46	5,74	3,2	11,3	1,45	
1 3/4	5000	RX 205	62,31	5,56	3,05	11,1	1,83	
2 1/4	5000	RX 210	97,63	9,53	5,41	19,05	3,18	
4	5000	RX 215	140,89	11,91	5,33	25,4	4,24	
4x 4 1/4	5000	RX 215	140,89	11,91	5,33	25,4	4,24	

* A compensating drilled hole on the periphery of the ring.

Ring-Joint Gasket, Type BX

Ring-joint gasket, type BX, dimensions according to API Std 6 A for API 6BX flanges



Order example for a ring-joint gasket, profile A12, nominal pipe size 3 1/16 inches, class 15000, made of...¹⁾):

Ring-joint gasket BX 154 A12/1.4541

1) State material with order

Dimensions in mm						
NPS	class	Ring no	Ring dimensions			1* drilled ho
			d1	b	h	
1 11/16	10000, 15000	BX 150	72,19	9,30	9,30	1,6
1 13/16	10000, 15000, 20000	BX 151	76,40	9,63	9,63	1,6
2 1/16	10000, 15000, 20000	BX 152	84,68	10,24	10,25	1,6
2 9/16	10000, 15000, 20000	BX 153	100,94	11,38	11,38	1,6
3 1/16	10000, 15000, 20000	BX 154	116,84	12,40	12,40	1,6
4 1/16	10000, 15000, 20000	BX 155	147,96	14,22	14,22	1,6
7 1/16	10000, 15000, 20000	BX 156	237,92	18,62	18,62	3,2
9	10000, 15000	BX 157	294,46	20,98	20,98	3,2
11	10000, 15000	BX 158	352,04	23,14	23,14	3,2
13 5/8	10000	BX 159	426,72	25,70	25,70	3,2
13 5/8	5000	BX 160	402,59	13,74	23,83	3,2
16 3/4	5000, 10000	BX 161	491,41	16,20	28,07	3,2
16 3/4		BX 162	475,49	14,22	14,22	1,6
18 3/4	5000	BX 163	556,16	17,37	30,10	3,2
18 3/4	10000	BX 164	570,56	24,59	30,10	3,2
21 1/4	5000	BX 165	624,71	18,49	32,03	3,2
21 1/4	10000	BX 166	640,03	26,14	32,03	3,2
26 3/4	2000	BX 167	759,36	13,11	35,86	1,6
26 3/4	3000	BX 168	765,25	16,05	35,86	1,6
5 1/8	10000	BX 169	173,52	12,93	15,84	1,6
9	2000, 3000	BX 170	218,03	14,22	14,22	1,6
11		BX 171	267,44	14,22	14,22	1,6
13 5/8		BX 172	333,07	14,22	14,22	1,6
30		BX 303	852,75	16,97	37,95	1,6

* A compensating drilled hole on the periphery of the ring.