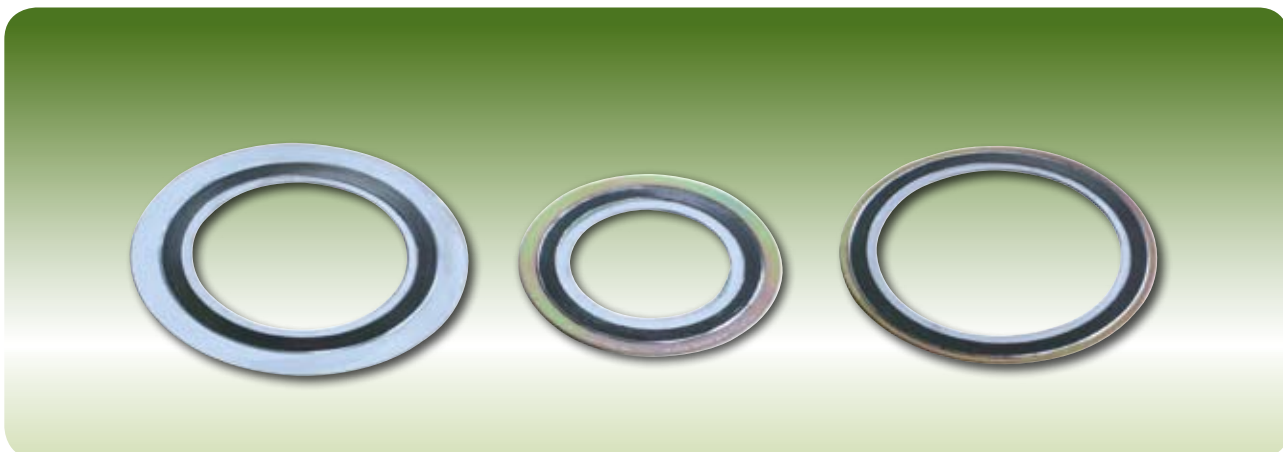


SEMI METALLIC GASKET | SPIRAL WOUND GASKET



• INTRODUCTION

Over the last decade high quality Spiral Wound Gaskets have proved themselves to be the most reliable sealing element for use in difficult, critical and arduous duties. This applies particularly in the Refinery, Petrochemical, Chemical, Steam Raising and Process industries, where they have many advantages over the older types of gaskets. e.g

• SEAL MAINTAINED UNDER THE MOST EXACTING CONDITIONS

From cryogenic to at least 538°C(1000°F) - Thermal cycling, Vibration, Mechanical shock, Dry gases, High vacuum.

• EASE OF INSTALLATION

Quick and simple to fit Do not need Grooved or Lapped flange face finishes. Can often be used on pitted or misaligned flanges where other gaskets have failed. Don't cause corrosion. Do not adhere to flange faces when opened thus reducing expensive cleaning time.

• CONTROLLED COMPRESSIBILITY

By altering the tension, number and thickness of the windings in the gasket construction, an infinite number of stress values can be produced to suit the actual design and service conditions, thus ensuring a constant gasket stress at all times.

• WIDE CHOICE OF MATERIALS

STRIP Stainless Steel(304, 304L, 316, 316L, 321, 347, etc.) Monel, Nickel, Titanium, Inconel, Hastelloy, Copper, Aluminum, etc.

FILLER GRAFLEX, P.T.FE, Non asbestos, etc.

INNER & OUTER-RING : Carbon steel-Zinc plated with chrome passivate for corrosion protection.

Stainless Steel(304, 410, 316, etc.) Monel, Titanium, etc.

• RELIABILITY AND LONG LIFE

This we ensure because of the care taken in our manufacturing program, using the winding machines of latest design, rigid quality control standards, the very best craftsmen and highest quality materials.

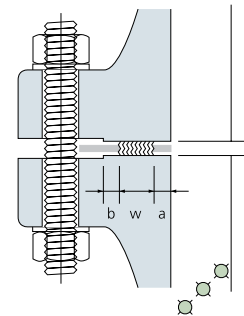
■ Space and clearance for gasket

The width of spiral wound gasket, when it is compressed, tends to expand and a space for the expansion is to be taken into account in design of flanges or joints.

1) Flat or raised face is widely employed for pipe flanges and machinery joints as a gasket seating face. Spiral wound gasket with outer ring or with inner/ outer rings is normally used on such flanges or joints. The following space is ideal for the gasket and it is desired to be taken into account when designing new machinery and equipments.

I.D or O.D of spiral wound sealing element		Minimum space	
		a	b
50	- 50	2	2
101	- 100	3	2
101	- 250	4	3
251	- 630	5	3
631	- 1,600	7.5	5
1,601	-	10	5

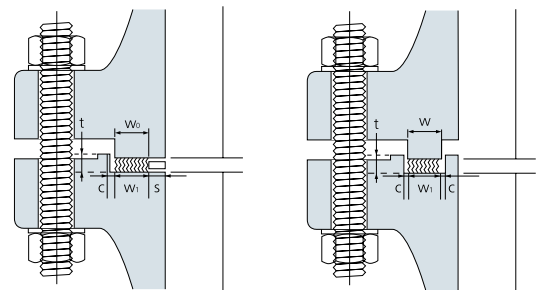
(Unit : mm)



2) Tongue-and-groove or male-and-female flange is sometimes employed in pressure vessels and valve bonnets. Standard type of spiral wound gasket (Without ring) is normally used for the former case and spiral wound gasket with inner ring for the latter case. It is desired to have the following clearance for the said gaskets.

I.D or O.D of spiral wound sealing element		Standard clearance	Minimum space
		c	s
251	- 250	0.5	4
631	- 630	0.8	5
631	- 1,600	1.0	7.5
1,601	-	1.3	10

(Unit : mm)



Notes

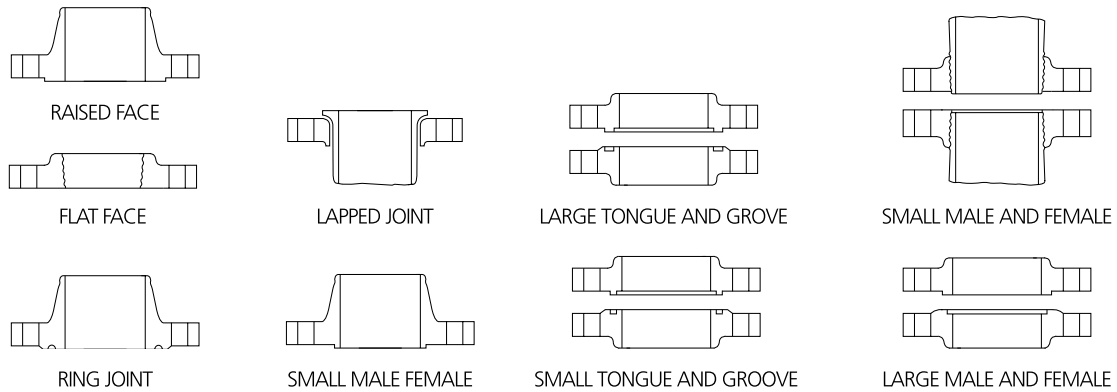
1. Using 5~8mm outer ring or winding more 3.2mm Hoop with 3~8mm width at the end of 4.5mm Hoop & Filler of outside gasket is able to prevent a damage at the end of Hoop & Filler of the gasket which is used for male & Female flange.

The value of W_1 is normally regarded as the width of gasket sealing element. The gasket contact area W_0 can be obtained in the following way.

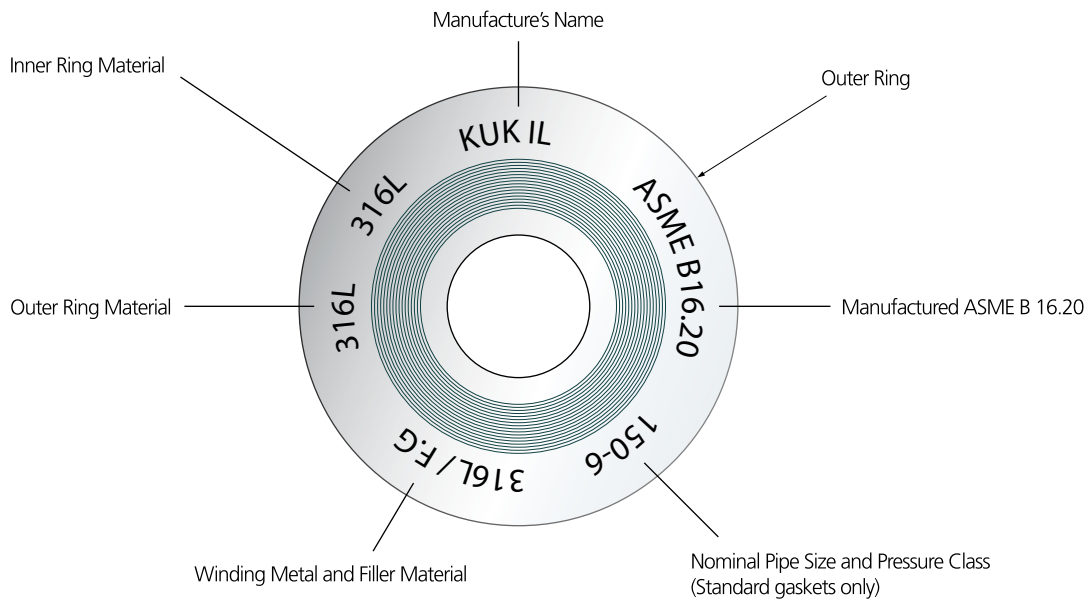
in case of nominal gasket thickness 6.4mm	$W_0 = W_1 - 2.0\text{mm}$
in case of nominal gasket thickness 4.5mm	$W_0 = W_1 - 1.5\text{mm}$
in case of nominal gasket thickness 3.2mm	$W_0 = W_1 - 1.0\text{mm}$

The depth (t) of Tongue and groove or male-and-female flange must have the size more than 5mm if nominal gasket thickness is 4.5mm.

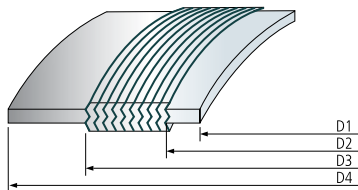
Flange Facing



ASME B16.20 Marking



Gasket compression and tolerance



KUKIL NO.	Minimum space		Compressed Thickness	Ring(a) Inner & Outer
	Thickness	Tolerances		
A	3.2	±0.13	2.3~2.5	2.0
B	4.5	±0.13	3.2~3.4	3.0
C	6.4	±0.13	4.5~5.1	4.0
D	7.2	±0.13	4.5~5.6	4.0



(a) :The thickness of inner ring & outer ring of gasket except 4.5T (KUKIL NO. B) is optional with the customer.

(Unit : mm)

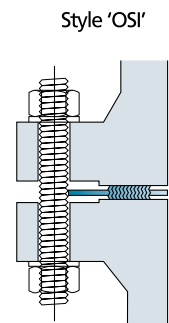
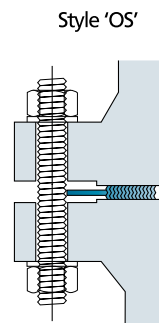
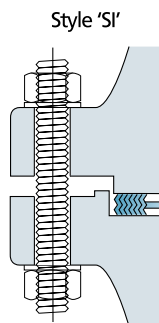
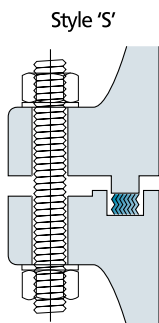
	ASME B16.20			Tolerances
	ANSI B 16.5	ANSI B 16.47-A	ANSI B 16.47-B	
D1	1/2" ~ 3"	-	-	±0.8
	4" ~ 24"	-	-	±1.5
	-	26" ~ 60"	26" ~ 60"	±3.0
D2	1/2" ~ 8"	-	-	±0.4
	10" ~ 24"	-	-	±0.8
	-	26" ~ 34"	26" ~ 34"	±0.8
D3	-	36" ~ 60"	36" ~ 60"	±1.3
	1/2" ~ 8"	-	-	±0.8
	10" ~ 24"	-	-	+1.5 / -0.8
D4	-	26" ~ 60"	26" ~ 60"	±1.5
	1/2" ~ 24"	-	-	±0.8
	-	26" ~ 60"	26" ~ 60"	±0.8

■ SPIRAL WOUND GASKET FOR PIPE FLANGES

Section	Style	Type
	S	Standard type
	SI	With inner ring type

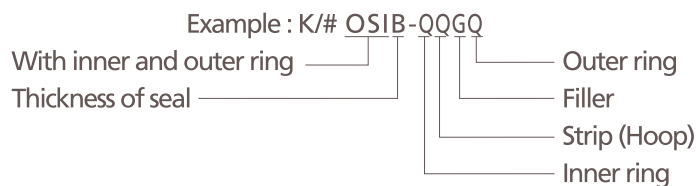
Section	Type	Style
	OS	With outer ring type
	OSI	With inner and outer ring type

Thickness of seal	MATERIAL SPEC	Table B-1		Table B-2	
		Material	Code	Material	Code
A : 3.2mm	INNER RING - TABLE B-1	Carbon Steel	S	GRAFLEX	G
B : 4.5mm	STRIP - TABLE B-1	Copper	C	Special P. T. F. E tape	P
C : 6.4mm	FILLER - TABLE B-2	Aluminium	A	Non Asbestos paper	N
D : 7.4mm	OUTER RING - TABLE B-1	Brass	B		
E : Special order		SS 304	E		
		SS 304L	L		
		SS 310S	O	Ceramic	C
		SS 316	G		
		SS 316L	Q	Mica	M
		SS 317L	W		
		SS 321	J	Mica / GRAFLEX / Mica	MGM
		SS 347	K		
		SS 410	V		
		SS 430	U		
		Monel	M		
		Hastelloy	H		
		Inconel	I		
		Nickel	N		
		Titanium	T		
		Al - bronze	R		
		5Cr - 0.5Mo	F		
		Duplex	Du		



Notes

1. Customers may describe style of section, material of Inner ring, metal strip, filler and outer ring by symbol mark as mentioned in _____.

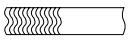
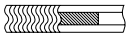


2. KUKIL INNTOT can be on request utilize any materials that are available for spiral wound gasket.

3. Heat resistance of filler materials, see page 98.

4. Using 5~8mm outer ring or winding more 3.2mm Hoop with 3~8mm width at the end of 4.5mm Hoop & Filler of outside gasket is able to prevent a damage at the end of Hoop & Filler of the gasket which is used for male & Female flange.

■ SPIRAL WOUND GASKET FOR HEAT EXCHANGER

Section	Style	Type
	SH	Standard type
	SIH	With inner ring type



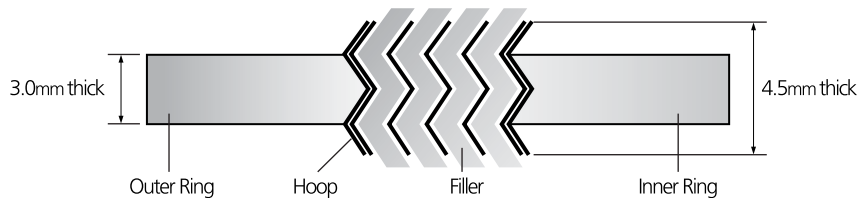
Section	Style	Type
	OSH	With outer ring type
	OSIH	With inner and outer ring type

Table B-1		Table B-2		Thickness of seal	MATERIAL SPEC	SHAPE OF RIB PARTITION		HEAT EXCHANGER SHAPES
Material	Code	Material	Code					
Carbon Steel	S	GRAFLEX	G	A : 3.2mm	INNER RING - TABLE B-1	None	0	see (page 48)
Copper	C	Special P. T. F. E tape	P			B : 4.5mm	STRIP - TABLE B-1	
Aluminium	A	Non Asbestos paper	N	C : 6.4mm	FILLER - TABLE B-2	Tube	2	
Brass	B							
SS 304	E	Ceramic	C	D : 7.2mm	OUTER RING - TABLE B-1			
SS 304L	L							
SS 310S	O	Mica	M	E : Special order				
SS 316	G							
SS 316L	Q	Mica / GRAFLEX / Mica	MGM					
SS 317L	W							
SS 321	J							
SS 347	K							
SS 410	V							
SS 430	U							
Monel	M							
Hastelloy	H							
Inconel	I							
Nickel	N							
Titanium	T							
Al - bronze	R							
5Cr - 0.5Mo	F							
Duplex	Du							

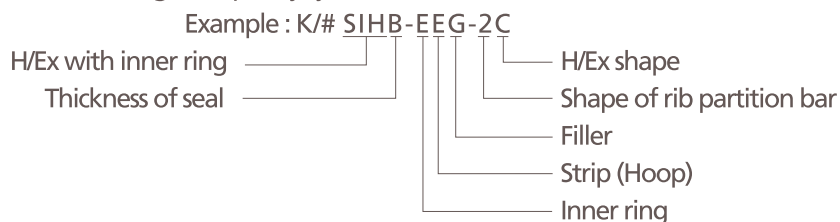
Spiral Wound Gasket thickness cross section



* The gasket-thickness tolerance is $\pm 0.13\text{mm}$ measured across the metallic portion of the gasket not including the filler, which may protrude slightly beyond the metal. (ASME B 16.20-2007)

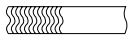
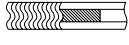
Notes

1. Customers may describe style of section, thickness of material of inner ring, metal strip, filler, outer ring, seal shape of rib partition and heat exchanger shapes by symbol mark as mentioned in _____



2. KUKIL INNTOT can be on request utilize any materials that are available for spiral wound gasket.
3. A metal jacket can be used for inner ring.
4. Heat resistance of filler materials, see page 98.

■ IRREGULAR SPIRAL WOUND GASKET

Section	Style	Type
	SG	Standard type
	SIG	With inner ring type



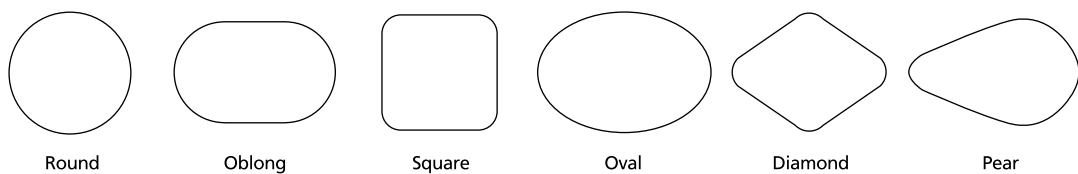
Section	Style	Type
	OSG	With outer ring type
	OSIG	With inner and outer ring type

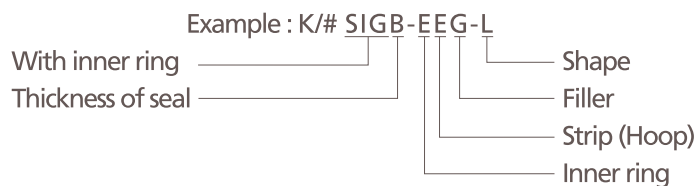
Table B-1		Table B-2		Thickness of seal	MATERIAL SPEC	SHAPES	
Material	Code	Material	Code				
Carbon Steel	S	GRAFLEX	G	A : 3.2mm	INNER RING - TABLE B-1	Round	R
Copper	C						
Aluminium	A	Special P. T. F. E tape	P	B : 4.5mm	STRIP - TABLE B-1	Square	S
Brass	B						
SS 304	E	Non Asbestos paper	N				
SS 304L	L			C : 6.4mm	FILLER - TABLE B-2	Diamond	D
SS 310S	O	Ceramic	C				
SS 316	G			D : 7.2mm	OUTER RING - TABLE B-1	Oval	O
SS 316L	Q	Mica	M				
SS 317L	W			E : Special order		Oblong	L
SS 321	J	Mica / GRAFLEX / Mica	MGM			Pear	P
SS 347	K						
SS 410	V						
SS 430	U						
Monel	M						
Hastelloy	H						
Inconel	I						
Nickel	N						
Titanium	T						
Al - bronze	R						
5Cr - 0.5Mo	F						
Duplex	Du						

KUKIL INNTOT STYLE - Round, Oblong, Square, Oval, Diamond and Pear shapes are available.



Notes

1. Customers may describe style of section, thickness of seal, material of inner ring, metal strip, filler, outer ring and shapes by symbol mark as mentioned in _____

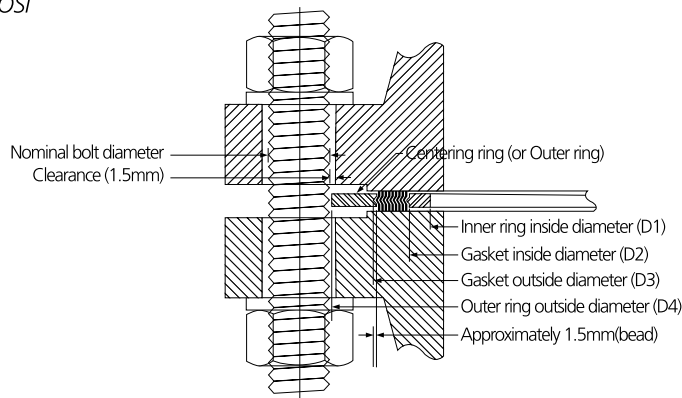


- KUKIL INNTOT can be on request utilize any materials that are available for spiral wound gasket.
- Heat resistance of filler materials, see page 98.

■ Size of spiral wound gasket : ASME B 16.20-2007

Spiral wound gasket dimensions for ANSI B 16.5 (or ASME/ANSI B 16.5) Flanges

KUKIL INNTOT STYLE OSI



(Unit : mm)

FLANGE SIZE (NPS)	150#				300#				400#				600#				FLANGE SIZE (NPS)
	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	
1/2"	14.2	19.1	31.8	47.8	14.2	19.1	31.8	54.1	(b)	(b)	31.8	(b)	14.2	19.1	31.8	54.1	1/2"
3/4"	20.6	25.4	39.6	57.2	20.6	25.4	39.6	66.8	(b)	(b)	39.6	(b)	20.6	25.4	39.6	66.8	3/4"
1"	26.9	31.8	47.8	66.8	26.9	31.8	47.8	73.2	(b)	(b)	47.8	(b)	26.9	31.8	47.8	73.2	1"
1 1/4"	38.1	47.8	60.5	76.2	38.1	47.8	60.5	82.6	(b)	(b)	60.5	(b)	38.1	47.8	60.5	82.6	1 1/4"
1 1/2"	44.5	54.1	69.9	85.9	44.5	54.1	69.9	95.3	(b)	(b)	69.9	(b)	44.5	54.1	69.9	95.3	1 1/2"
2"	55.6	69.9	85.9	104.9	55.6	69.9	85.9	111.3	(b)	(b)	85.9	(b)	55.6	69.9	85.9	111.3	2"
2 1/2"	66.5	82.6	98.6	124.0	66.5	82.6	98.6	130.3	(b)	(b)	98.6	(b)	66.5	82.6	98.6	130.3	2 1/2"
3"	81.0	101.6	120.7	136.7	81.0	101.6	120.7	149.4	(b)	(b)	120.7	(b)	81.0	101.6	120.7	149.4	3"
4"	106.4	127.0	149.4	174.8	106.4	127.0	149.4	181.1	102.6	120.7	149.4	177.8	102.6	120.7	149.4	193.8	4"
5"	131.8	155.7	177.8	196.9	131.8	155.7	177.8	215.9	128.3	147.6	177.8	212.9	128.3	147.6	177.8	241.3	5"
6"	157.2	182.6	209.6	222.3	157.2	182.6	209.6	251.0	154.9	174.8	209.6	247.7	154.9	174.8	209.6	266.7	6"
8"	215.9	233.4	263.7	279.4	215.9	233.4	263.7	308.1	205.7	225.6	263.7	304.8	205.7	225.6	263.7	320.8	8"
10"	268.2	287.3	317.5	339.9	268.2	287.3	317.5	362.0	255.3	274.6	317.5	358.9	255.3	274.6	317.5	400.1	10"
12"	317.5	339.9	374.7	409.7	317.5	339.9	374.7	422.4	307.3	327.2	374.7	419.1	307.3	327.2	374.7	457.2	12"
14"	349.3	371.6	406.4	450.9	349.3	371.6	406.4	485.9	342.9	362.0	406.4	482.6	342.9	362.0	406.4	492.3	14"
16"	400.1	422.4	463.6	514.4	400.1	422.4	463.6	539.8	389.9	412.8	463.6	536.7	389.9	412.8	463.6	565.2	16"
18"	449.3	474.7	527.1	549.4	449.3	474.7	527.1	596.9	438.2	469.9	527.1	593.9	438.2	469.9	527.1	612.9	18"
20"	500.1	525.5	577.9	606.6	500.1	525.5	577.9	654.1	489.0	520.7	577.9	647.7	489.0	520.7	577.9	682.8	20"
24"	603.3	628.7	685.8	717.6	603.3	628.7	685.8	774.7	590.6	628.7	685.8	768.4	590.6	628.7	685.8	790.7	24"

FLANGE SIZE (NPS)	900#				1500#				2500#				FLANGE SIZE (NPS)
	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	
1/2"	(b)	(b)	31.8	(b)	14.2	19.1	31.8	63.5	14.2	19.1	31.8	69.9	1/2"
3/4"	(b)	(b)	39.6	(b)	20.6	25.4	39.6	69.9	20.6	25.4	39.6	76.2	3/4"
1"	(b)	(b)	47.8	(b)	26.9	31.8	47.8	79.5	26.9	31.8	47.8	85.9	1"
1 1/4"	(b)	(b)	60.5	(b)	33.3	39.6	60.5	88.9	33.3	39.6	60.5	104.9	1 1/4"
1 1/2"	(b)	(b)	69.9	(b)	41.4	47.8	69.9	98.6	41.4	47.8	69.9	117.6	1 1/2"
2"	(b)	(b)	85.9	(b)	52.3	58.7	85.9	143.0	52.3	58.7	85.9	146.1	2"
2 1/2"	(b)	(b)	98.6	(b)	63.5	69.9	98.6	165.1	63.5	69.9	98.6	168.4	2 1/2"
3"	78.7	95.3	120.7	168.4	78.7	92.2	120.7	174.8	78.7	92.2	120.7	196.9	3"
4"	102.6	120.7	149.4	206.5	97.8	117.6	149.4	209.6	97.8	117.6	149.4	235.0	4"
5"	128.3	147.6	177.8	247.7	124.5	143.0	177.8	254.0	124.5	143.0	177.8	279.4	5"
6"	154.9	174.8	209.6	289.1	147.3	171.5	209.6	282.7	147.3	171.5	209.6	317.5	6"
8"	196.9	222.3	257.3	358.9	196.9	215.9	257.3	352.6	196.9	215.9	257.3	387.4	8"
10"	246.1	276.4	311.2	435.1	246.1	266.7	311.2	435.1	246.1	270.0	311.2	476.3	10"
12"	292.1	323.9	368.3	498.6	292.1	323.9	368.3	520.7	292.1	317.5	368.3	549.4	12"
14"	320.8	355.6	400.1	520.7	320.8	362.0	400.1	577.9	(b)	(b)	400.1	(b)	14"
16"	374.7	412.8	457.2	574.8	368.3	406.4	457.2	641.4	(b)	(b)	457.2	(b)	16"
18"	425.5	463.6	520.7	638.3	425.5	463.6	520.7	704.9	(b)	(b)	520.7	(b)	18"
20"	482.6	520.7	571.5	698.5	476.3	514.4	571.5	755.7	(b)	(b)	571.5	(b)	20"
24"	590.6	628.7	679.5	838.2	577.9	616.0	679.5	901.7	(b)	(b)	679.5	(b)	24"

Notes

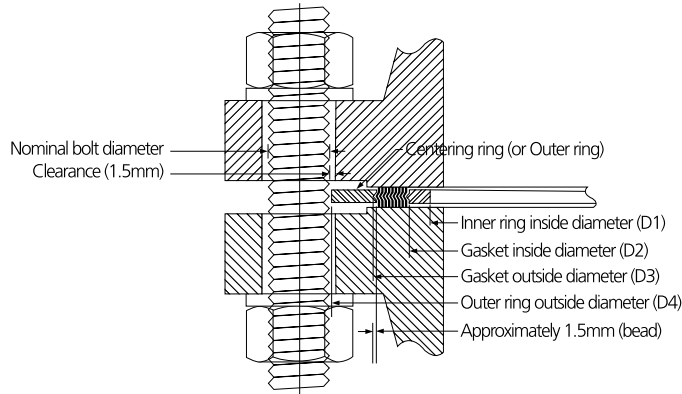
For limitation on the maximum flange bore for use with these spiral wound gaskets, see Table A-1 (page 41)

For minimum pipe wall thickness that are suitable for use with standard inner ring, see Table B (page 43)

^aInner rings are required for Class 900 gaskets, NPS 24; class 1500 gaskets, NPS 12 through NPS 24; and class 2500 gaskets, NPS 4 through NPS 12.

^bThere are no NPS ½ through 3 Class 400 flanges (use Class 600), NPS ½ through NPS 2½ Class 900 flanges (use Class 1500), or NPS 14 and larger Class 2500 flanges.

Spiral wound gasket dimensions for ASME B 16.47 Series A (or MSS SP-44) Flanges



(Unit : mm)

FLANGE SIZE (NPS)	150#				300#				400#				600#				FLANGE SIZE (NPS)
	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	
26"	654.1	673.1	704.9	774.7	654.1	685.8	736.6	835.2	660.4	685.8	736.6	831.9	647.7	685.8	736.6	866.9	26"
28"	704.9	723.9	755.7	831.9	704.9	736.6	787.4	898.7	711.2	736.6	787.4	892.3	698.5	736.6	787.4	914.4	28"
30"	755.7	774.7	806.5	882.7	755.7	793.8	844.6	952.5	755.7	793.8	844.6	946.2	755.7	793.8	844.6	971.6	30"
32"	806.5	825.5	860.6	939.8	806.5	850.9	901.7	1006.6	812.8	850.9	901.7	1003.3	812.8	850.9	901.7	1022.4	32"
34"	857.3	876.3	911.4	990.6	857.3	901.7	952.5	1057.4	863.6	901.7	952.5	1054.1	863.6	901.7	952.5	1073.2	34"
36"	908.1	927.1	968.5	1047.8	908.1	955.8	1006.6	1117.6	917.7	955.8	1006.6	1117.6	917.7	955.8	1006.6	1130.3	36"
38"	958.9	977.9	1019.3	1111.3	952.5	977.9	1016.0	1054.1	952.5	971.6	1022.4	1073.2	952.5	990.6	1041.4	1104.9	38"
40"	1009.7	1028.7	1070.1	1162.1	1003.3	1022.4	1070.1	1114.6	1000.3	1025.7	1076.5	1127.3	1009.7	1047.8	1098.6	1155.7	40"
42"	1060.5	1079.5	1124.0	1219.2	1054.1	1073.2	1120.9	1165.4	1051.1	1076.5	1127.3	1178.1	1066.8	1104.9	1155.7	1219.2	42"
44"	1111.3	1130.3	1178.1	1276.4	1104.9	1130.3	1181.1	1219.2	1104.9	1130.3	1181.1	1231.9	1111.3	1162.1	1212.9	1270.0	44"
46"	1162.1	1181.1	1228.9	1327.2	1152.7	1178.1	1228.9	1273.3	1168.4	1193.8	1244.6	1289.1	1162.1	1212.9	1263.7	1327.2	46"
48"	1212.9	1231.9	1279.7	1384.3	1209.8	1235.2	1286.0	1324.1	1206.5	1244.6	1295.4	1346.2	1219.2	1270.0	1320.8	1390.7	48"
50"	1263.7	1282.7	1333.5	1435.1	1244.6	1295.4	1346.2	1378.0	1257.3	1295.4	1346.2	1403.4	1270.0	1320.8	1371.6	1447.8	50"
52"	1314.5	1333.5	1384.3	1492.3	1320.8	1346.2	1397.0	1428.8	1308.1	1346.2	1397.0	1454.2	1320.8	1371.6	1422.4	1498.6	52"
54"	1358.9	1384.3	1435.1	1549.4	1352.6	1403.4	1454.2	1492.3	1352.6	1403.4	1454.2	1517.7	1378.0	1428.8	1479.6	1555.8	54"
56"	1409.7	1435.1	1485.9	1606.6	1403.4	1454.2	1505.0	1543.1	1403.4	1454.2	1505.0	1568.5	1428.8	1479.6	1530.4	1612.9	56"
58"	1460.5	1485.9	1536.7	1663.7	1447.8	1511.3	1562.1	1593.9	1454.2	1505.0	1555.8	1619.3	1473.2	1536.7	1587.5	1663.7	58"
60"	1511.3	1536.7	1587.5	1714.5	1524.0	1562.1	1612.9	1644.7	1517.7	1568.5	1619.3	1682.8	1530.4	1593.9	1644.7	1733.6	60"

FLANGE SIZE (NPS)	900#			
	D1	D2	D3	D4
26"	660.4	685.8	736.6	882.7
28"	711.2	736.6	787.4	946.2
30"	768.4	793.8	844.6	1009.7
32"	812.8	850.9	901.7	1073.2
34"	863.6	901.7	952.5	1136.7
36"	920.8	958.9	1009.7	1200.2
38"	1009.7	1035.1	1085.9	1200.2
40"	1060.5	1098.6	1149.4	1251.0
42"	1111.3	1149.4	1200.2	1301.8
44"	1155.7	1206.5	1257.3	1368.6
46"	1219.2	1270.0	1320.8	1435.1
48"	1270.0	1320.8	1371.6	1485.9
50"	(d)	(d)	(d)	(d)
52"	(d)	(d)	(d)	(d)
54"	(d)	(d)	(d)	(d)
56"	(d)	(d)	(d)	(d)
58"	(d)	(d)	(d)	(d)
60"	(d)	(d)	(d)	(d)

Notes

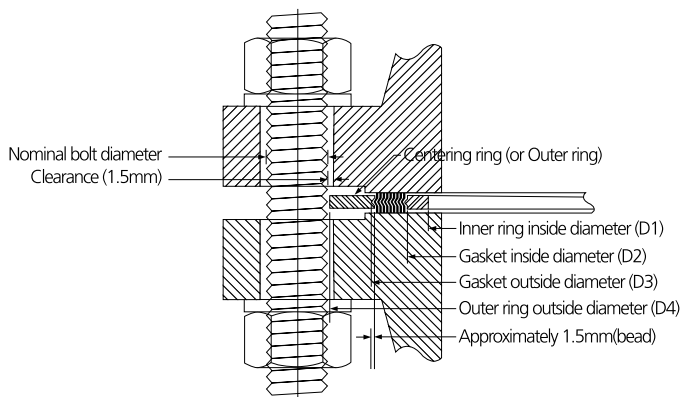
For limitation on the maximum flange bore for use with these spiral wound gaskets, see Table A-2 (page 42)

^cInner rings are required for Class 900 gaskets, NPS 26 through NPS 48

^dThere are no Class 900 flanges in NPS 50 and larger.

■ Size of spiral wound gasket : ASME B 16.20-2007

Spiral wound gasket dimensions for ASME B 16.47 Series B(or API Standard 605) Flanges



(Unit : mm)

FLANGE SIZE (NPS)	150#				300#				400#				600#				FLANGE SIZE (NPS)
	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	
26"	654.1	673.1	698.5	725.4	654.1	673.1	711.2	771.7	654.1	666.8	698.5	746.3	644.7	663.7	714.5	765.3	26"
28"	704.9	723.9	749.3	776.2	704.9	723.9	762.0	825.5	701.8	714.5	749.3	800.1	685.8	704.9	755.7	819.2	28"
30"	755.7	774.7	800.1	827.0	755.7	774.7	812.8	886.0	752.6	765.3	806.5	857.3	752.6	778.0	828.8	879.6	30"
32"	806.5	825.5	850.9	881.1	806.5	825.5	863.6	939.8	800.1	812.8	860.6	911.4	793.8	831.9	882.7	933.5	32"
34"	857.3	876.3	908.1	935.0	857.3	876.3	914.4	993.9	850.9	866.9	911.4	962.2	850.9	889.0	939.8	997.0	34"
36"	908.1	927.1	958.9	987.6	908.1	927.1	965.2	1047.8	898.7	917.7	965.2	1022.4	901.7	939.8	990.6	1047.8	36"
38"	958.9	974.9	1009.7	1044.7	971.6	1009.7	1047.8	1098.6	952.5	971.6	1022.4	1073.2	952.5	990.6	1041.4	1104.9	38"
40"	1009.7	1022.4	1063.8	1095.5	1022.4	1060.5	1098.6	1149.4	1000.3	1025.7	1076.5	1127.3	1009.7	1047.8	1098.6	1155.7	40"
42"	1060.5	1079.5	1114.6	1146.3	1085.9	1111.3	1149.4	1200.2	1051.1	1076.5	1127.3	1178.1	1066.8	1104.9	1155.7	1219.2	42"
44"	1111.3	1124.0	1165.4	1197.1	1124.0	1162.1	1200.2	1251.0	1104.9	1130.3	1181.1	1231.9	1111.3	1162.1	1212.9	1270.0	44"
46"	1162.1	1181.1	1224.0	1255.8	1178.1	1216.2	1254.3	1317.8	1168.4	1193.8	1244.6	1289.1	1162.1	1212.9	1263.7	1327.2	46"
48"	1212.9	1231.9	1270.0	1306.6	1231.9	1263.7	1311.4	1368.6	1206.5	1244.6	1295.4	1346.2	1219.2	1270.0	1320.8	1390.7	48"
50"	1263.7	1282.7	1325.6	1357.4	1267.0	1317.8	1355.9	1419.4	1257.3	1295.4	1346.2	1403.4	1270.0	1320.8	1371.6	1447.8	50"
52"	1314.5	1333.5	1376.4	1408.2	1317.8	1368.6	1406.7	1470.2	1308.1	1346.2	1397.0	1454.2	1320.8	1371.6	1422.4	1498.6	52"
54"	1365.3	1384.3	1422.4	1463.8	1365.3	1403.4	1454.2	1530.4	1352.6	1403.4	1454.2	1517.7	1378.0	1428.8	1479.6	1555.8	54"
56"	1422.4	1444.8	1478.0	1514.6	1428.8	1479.6	1524.0	1593.9	1403.4	1454.2	1505.0	1568.5	1428.8	1479.6	1530.4	1612.9	56"
58"	1478.0	1500.1	1528.8	1579.6	1484.4	1535.2	1573.3	1655.8	1454.2	1505.0	1555.8	1619.3	1473.2	1536.7	1587.5	1663.7	58"
60"	1535.2	1557.3	1586.0	1630.4	1557.3	1589.0	1630.4	1706.6	1517.7	1568.5	1619.3	1682.8	1530.4	1593.9	1644.7	1733.6	60"

FLANGE SIZE (NPS)	900#			
	D1	D2	D3	D4
26"	666.8	692.2	749.3	838.2
28"	717.6	743.0	800.1	901.7
30"	781.1	806.5	857.3	958.9
32"	838.2	863.6	914.4	1016.0
34"	895.4	920.8	971.6	1073.2
36"	920.8	946.2	997.0	1124.0
38"	1009.7	1035.1	1085.9	1200.2
40"	1060.5	1098.6	1149.4	1251.0
42"	1111.3	1149.4	1200.2	1301.8
44"	1155.7	1206.5	1257.3	1368.6
46"	1219.2	1270.0	1320.8	1435.1
48"	1270.0	1320.8	1371.6	1485.9
50"	(b)	(b)	(b)	(b)
52"	(b)	(b)	(b)	(b)
54"	(b)	(b)	(b)	(b)
56"	(b)	(b)	(b)	(b)
58"	(b)	(b)	(b)	(b)
60"	(b)	(b)	(b)	(b)

Notes

For limitation on the maximum flange bore for use with these spiral wound gaskets, see Table A-3 (page 42)

^aInner rings are required for Class 900 gaskets, NPS 26 through NPS 48

^bThere are no Class 900 flanges in NPS 50 and larger.

■ **Maximum Bore of ASME B16.5 Flanges
For Use With Spiral-Wound Gaskets (Table A-1)**

Flange size (NPS)	Pressure class								
	75	150	300	400	600	900 ^a	1500 ^a 2500 ^a		
1/2"	No flanges	WN flange only ^b	No flanges Use Class 600	No flanges Use Class 600	WN flange only ^b	No flanges Use Class 1500	WN flange only ^b		
3/4"					WN flange only ^b				
1"		SO flange ^c WN flange ^b			SO flange ^c WN flange ^b			SO flange ^b WN flange, any bore	SO flange ^c WN flange, any bore
1 1/4"									
1 1/2"		SO flange ^b WN flange, any bore			SO flange ^c WN flange, any bore			SO flange ^c WN flange, any bore	SO flange ^c WN flange, any bore
2"									
2 1/2"		SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore				
3"									
4"		SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore				
6"									
8"		SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore				
10"									
12"		SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore				
14"									
16"		SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore				
18"									
20"	SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore	SO flange WN flange, any bore					
24"									

Notes

This table shows the maximum bore of flanges for which the spiral wound gasket dimensions shown in page 38, Table are recommended considering the tolerances involved, possible eccentric installation, and the possibility. That the gasket may extend into the assembled flange bore.

SO= slip-on and threaded; WN=welding neck; SW=standard wall. For maximum permissible flange bores for nonmandatory inner rings, see Table "B" (page 43)

a - Inner rings are required for Class 900 gaskets, NPS 24; Class 1500 gaskets, NPS 12 through NPS 24; and Class 2500 gaskets, NPS 4 through NPS 12. These inner rings may extend into the pipe bore a maximum of 0.06 inch(1.5 mm) under the worst combination of maximum bore, eccentric installation, and additive tolerances.

b - In these sizes the gasket is suitable for a welding-neck flange with a standard wall bore, if the gasket and the flanges are assembled concentrically. This also applies to a nozzle. It is the user's responsibility to determine if the gasket is satisfactory for a flange of any larger bore.

c - Gaskets in these sizes are suitable for slip-on flanges only if the gaskets and flanges are assembled concentrically.

d - A nozzle is a long welding neck; the bore equals the flange NPS.

e - A NPS 24 gasket is suitable for nozzles.

Maximum Bore of ASME B 16.47 Series B(or API Standard 605) Flanges for use with Spiral wound Gasket (TABLE A-2)

FLANGE SIZE (NPS)	Pressure Class				
	150	300	400	600	900 ^a
26"					
28"					
30"					
32"					
34"					
36"					
38"					
40"					
42"					
44"					
46"					
48"					
50"					b
52"					b
54"					b
56"					b
58"					b
60"					b

Welding - neck and integral flanges having max. Inside diameters as described in ASME B 16.47

Notes

- a. Inner rings are required for class 900 gaskets, NPS 26 through NPS 48.
- b. There are no class 900 flanges NPS 50 and larger.

Maximum Bore of ASME B 16.47 Series A(or MSS SP-44) Flanges for use with Spiral wound Gasket (TABLE A-3)

FLANGE SIZE (NPS)	Pressure Class				
	150	300	400	600	900 ^a
26"	b	c	c	c	c
28"	b	c	c	c	c
30"	b	c	c	c	c
32"	b	c	c	c	c
34"	b	c	c	c	c
36"	b	c	c	c	c
38"	b	c	c	c	c
40"	b	c	c	c	c
42"	b	c	c	c	c
44"	b	c	c	c	c
46"	b	c	c	c	c
48"	b	c	c	c	c
50"	b	c	c	c	d
52"	b	c	c	c	d
56"	b	c	c	c	d
58"	b	c	c	c	d
60"	b	c	c	c	d

Notes

- a. Inner rings are required for class 900 gaskets, NPS 26 through NPS 48.
- b. Only welding-neck flanges with a bore not larger then the inside diameter of 0.187 inch(4.8mm) wall pipe. Larger bores must be checked.
- c. Only welding-neck flanges the inside diameter of 0.25 inch(6.4mm) wall pipe, except that NPS 38, class 300, is not suitable for bore larger than the inside diameter of 0.03inch(7.9mm) wall pipe. Larger bores must be checked individually.
- d. There are no class 900 flanges in NPS 50 through 60.

■ Minimum Pipe Wall Thickness Suitable For Use of Spiral-Wound Gaskets With Inner Rings For ASME B16.5 Flanges (Table "B")

Flange size (NPS)	Pressure Class						
	150	300	400	600	900	1500	2500
1/2"	Schedule 80						
3/4"							
1"							
1 1/4"	Schedule 40						
1 1/2"							
2"							
2 1/2"							
3"							
4"						Schedule 80	
5"							
6"							
8"	Schedule 10S		Schedule 30		Schedule 80		
10"							
12"							
14"							
16"							
18"							
20"							
24"							

Notes

- a. The pipe wall schedules identified represent the minimum recommended pipe wall thickness suitable for use with inner rings for ASME B 16.5 flanges. (Reference ASME B36.10M and B36.19M)
- b. Gaskets with inner rings should be used only with socket welding, lapped, welding neck, and integral flanges.