



## KAMMPROFILE GASKET



**"RISK FREE GASKETS, ON TIME"** 

## ABOUT US

Goodrich Gasket Private Limited is acknowledged as the market leader in manufacturing & supply of High - performance Industrial Static Sealing Products for the Global Processing Industries. Goodrich Gaskets is currently manufacturing and supplying the entire range of Industrial Gaskets from its 25,000 Sq.m state of the art brand new facility at Chennai, India. Founded in 1987 the company has more than 3000 satisfied customers worldwide. "At Goodrich Gaskets, we Design, Manufacture, Supply, Install, and give On-Site support for all of your Gasket needs and Concerns."

#### **OUR STRENGTHS**

- **24X7** operational facility to meet customer's emergency and shut down requirements.
- Proven track record with reliability and high Gasket Performance.
- Experience in manufacturing Gaskets for over three decades by investing in modern manufacturing technology.
- Complete control over all critical processes, including raw materials.
- Investing preferred by reputed oil majors and EPC contractors.
- Highly skilled engineers for designing products with optimal performance & ability to design products with special requirements.
- Customized product development working closely with the user groups.
- Quality Assurance Program Approved by Major EPC, PMC & PSUs.
- Wide distribution network Over 3000 Satisfied Customers Worldwide.
- Availability of Gaskets in various locations, including back up inventory at factories.

### **OUR CLIENTS**



## **Overview**

Kammprofile gaskets or Grooved metal gaskets has outstanding anti-blowout capabilities, as well as the dependability of a strong seal and a soft sealing face that ensures a tighter joint. Kammprofile is an ideal replacement for problem applications associated with all Heat-Exchanger Gaskets Outstanding sealing characteristics in a wide range of seating stress levels helps compensate for wide swings in temperature and pressure.Very forgiving of inconsistent bolt torquing or installation error. Applicable to almost all types of flanges regardless of bolt load is available.The working thickness of sealing layers is extremely small, reducing fugitive emissions. Low seating stresses are required to reduce flange damage and gasket removal problems. Offers extreme temperature and chemical resistance because of the variety of materials used.



#### **ADVANTAGES**

Kammprofile gaskets have a wide seating stress range which makes them:

- Highly suitable for varying temperatures and pressures
- Less sensitive to assembly faults (inaccurate bolt tensioning)
- Suitable for both light and heavy designed flanges
- Temperature resistance up to approx 1000°C depending upon on layer material
- Resistance to media pressures up to 500 bar
- Will not damage flange surface and is easily removed.

#### **RECOMMENDED APPLICATIONS**

Process Industries
Oil & Gas Industries
Petrochemical Industries
Chemical Industries
Power Plants

- Building Services Industries

## MECHANICAL UNITS

- Heat exchanger
- Covers
- Tank hatches
- Process Boilers
- Flanged connections
- Pipe connections

### Size and Class

Kammprofile Gasket or Grooved Metal Gaskets with covering layers including centering ring are identified by Flange size (NPS), Pressure class, and appropriate flange standards (ASME B16.5, ASME B 16.47).

#### GOODRICH TYPE PN

**Goodrich - Type PN** Kammprofile gaskets consist of a metallic core with machined concentric grooves. Both faces are produced with soft sealing layers consisting of either graphite, Mica or PTFE. It is the preferred design when needing improved performance at low seating stresses. The simultaneous actions of high compressibility facing material on the outside of the grooved metal in combination with limited penetration of the tips of the solid metal core enhance the interaction of the two materials. This allows the component to perform individually to their optimum capabilities.

## GOODRICH TYPE ZG

**Goodrich - Type ZG** is an addition of an integral outer locating ring for exact gasket positioning within the mating flange bolt circle. These are used on Standard Raised and Flat Face Fange assemblies.

## GOODRICH TYPE ZA

**Goodrich - Type ZA** the integral outer locating ring is replaced by a loose fitting independent ring which is preferred in applications where differential



#### GOODRICH TYPE CONVEX

When compared to standard grooved profiles, the **Goodrich - Type PN Convex, Type ZA Convex, Type ZG Convex** gaskets demonstrated improved sealing properties. The special convex form achieves the improvement by decreasing the depth of the groove troughs towards the profile's midpoint. The soft material sealing layer creates thicker padding at the profile centerline than in the internal and external zones.



#### GENERAL SPECIFICATION

- Goodrich Kammprofile gaskets with covering layers shall be constructed as a concentrically grooved metal core (sealing element) with a centering ring.
- The grooved metal portion of the finished gasket shall be faced with a covering layer on both sealing surfaces that is 0.46mm (0.018in) to 0.56-mm (0.022in) thick.
- The thickness of the metal core of the gasket shall be 2.97mm (0.117in) to 3.33mm (0.131in).
- The thickness of any single gasket shall be uniform within a maximum tolerance range of 0.13mm (0.005in).
- Welding is permitted only in NPS 14 and larger gaskets. Welding shall be subject to the following:
   (a) Full penetration welds shall be used.
   (b) Where only two welds are used, the minimum weld spacing shall be 152mm (6inch).
- Where more than two welds are required, minimum weld spacing shall be 609mm (24in). Weld spacing shall be measured along the inside circumference of the metal core.
- A centering ring is required and used to help position the gasket within the flange bolt circle. Unless otherwise specified by the purchaser, the centering ring shall be 1.6mm (0.06in) nominal thickness and shall be suitably attached to the grooved metal core using an integral (one-piece or welded) or non-integral attachment method.

- The thickness of the centering ring shall not exceed the thickness of the core.
- Kammprofile Gaskets shall be marked with a color code that identifies the metal core and facing materials. A continuous color around the outer edge of the centering ring shall identify the core metal.
- The color identifying the facing material for NPS 3 and larger shall have a minimum of four stripes equally spaced on the outer edge of the centering ring. Smaller size gaskets shall have a minimum of two stripes 180° apart.
- When material availability precludes this weld spacing, then additional welding, as agreed by the purchaser and manufacturer is permitted.
- The grooves shall be machined into the core after welding.
- In welded areas, the groove, peak profile, and base metal shall be uniform in spacing, thickness, and height with the adjacent metal core.
- When specified by the purchaser, weld inspection methods, such as ultrasonic or radiographic, along with acceptance criteria, shall be established.

### **Standard Core Materials:**

Maxiprofile Gaskets are available to order in a wide range of components materials to suit specific applications.

#### **Standard Facing Materials:**

Expanded graphite is the most common facing material used for Maxiprofile gaskets. However, other materials can be used, such as PTFE for chemically aggressive duties or Mica for high temperature service.

	METALLIC	MATERIALS			
MATERIALS	Identificationt	Color coding	Temperature Range		
	ASME B16.20				
	METALLICI	MATERIALS			
Carbon Steel	CRS	Silver	- 25/+500		
SS304	304(L)	Yellow	- 200/+900		
SS316	316(L)	Green	- 100/+550		
SS321	321	Turqoise	-200/+550		
SS347	347	Blue	-200/+550		
Nickel 200	NI200	Red	-100/+450		
Nickel 201	NI201	Red	-100/+550		
Monel® / Alloy 400	MON	Orange	-50/+500		
Inconel® / Alloy 600	INC600	Gold	-100/+650		
Inconel® / Alloy 625	INC625	Gold	-100/+800		
Inconel® / Alloy X-750	INX	No colour	-100/+700		
Incoloy® / Alloy 800	IN800	White	-100/+550		
Incoloy® / Alloy 825	IN825	White	-200/+800		
Hasteloy® / Alloy B2	HAST B	Brown	-100/+500		
Hasteloy® / Alloy C276	HAST C	Beige	-100/+600		
Titanium	ті	Purple	-100/+350		
	SOFT FILLER	MATERIALS			
Graphite	FG	Gray stripe	- 250/+ 450 (+ 550)		
PTFE (Teflon®)	PTFE	White stripe	-240/+260		
Ceramic	CER	Light green stripe	- 50/+1000		
Mica	MICA	Light blue stripe	- 50/+900		
GASKET TYPE	GASKET MATERIALS	GASKET FACTOR (m)	MINIMUMDESIGN SEATINGSTRESS (y)(psi)		
	Soft aluminum	3.25	5500		
	Soft copper or brass	3.50	6500		
	Iron or soft steel	3.75	7600		
	Monel or 4%-6% chrome	3.75	9000		
	Stainless steels & Nickel based alloys	4.25	10100		

## **Gasket Thickness**

INITIAL GASKET THICKNESS mm	RECOMMENDED COMPRESSED THICKNESS mm
1.6	1.3/ 1.4
2.5	1.9 / 2.0
3.2	2.3/ 2.5
4.5	3.2/ 3.4
6.4	4.6/ 5.1
7.2	5.1/ 5.6

## TYPE ACCEPTANCE TEST KAMMPROFILE GASKET

The Type Acceptance Test (TAT) is installed to verify the design, performance and technical integrity of the gaskets and manufacturing plant. The design of the gaskets shall meet the applicable international design standard as amended and supplemented by the applicable MESC SPE requirements

	Table 3 - Tests for gaskets as part of the TAT																
Γ									Туре С	)f test	s						
	Gasket type	Cover layer material	Visual Examination	Fugitive Emissions	Fire test	Room Temperature operation Tightness test ( ROTT)	High Temperature operation Tightness test ( HOTT)	Hot Blowout test	Aged Tensile Relaxation screening (ATRS)	Medium Resistance Test	Glude Identification	Cold Compression / Hot Creep Relaxation Test	Cold Compression/ hot Recovery Test	Leak Test	Gasket Adhesion	BAM	Electrical Isolation
peto	aleu	Graphite	•	•	•	•	•				•				•		
d corr	netal	PTFE	•	•		•	•				•						
- Cover		Mica, Vermiculite	•	•	•	•	•				•				•		

Goodrich Gasket Privat Designed to: MESC MESC	e Limited : Me SPE 85/300 ( SPE 85/100 ( SPE 85/203 (	tal grooved with Graphite February 2017 ) February 2017 ) February 2017 )	Type Acceptance Testing in accordance to Shell MESC SPE 85/300 (February 2017), Carried out by Goodrich gasket testing Laboratories in period February 2018; with witness testing carried out by M/S. Lloyd's Registror Asia during period February 2018 & Date : 24.02.2018						
Types Of Test	Clause No:	Description	Test method/ Specification	Result	Pass/ Na				
Visual Examination	3.3.1	Visual Inspection	Visual Checking	No Significant Marks	Pass				
Fugitive Emisssion	3.3.2	Leakage test at ambient & design temperature	Helium at a constant system pressure 600 PSI & Testing Temperature @ 20° C & 450°C	2.6 x 10^(-13) Pa.m3/S/mm, Emission levels significantly lower than shall tightness Class A (H)	Pass				
Room Temprature Operation Tightness Test (ROTT)	3.3.4	Compression test at ambient temperature Compression test at 450° CRelaxation test at Ambient TemperatureRelaxation test at 450° C Leakage Test	EN 13555/ Gasket Characteristic Properties	Qs Max 160 MPa Qs Max 160 MPa PQR 1.00at 75 MPa PQR 1.00 at 75 MPa QSMIN (0.00001) 20 MPa	NA				
HighTemprature Operation Tightness Test (HOTT)	3.3.5	1. Temperature raised from ambient to 450°C at a rate of 100°C/hr 2. Increase Test pressure 600 Psi @ 450°C Hold for 1 hour 3. Decrease test temperature 10 ambient Temperature 4. Repeat the step 1 & repeat step 3 5. Repeat step 1 & for 02 times Maximum adhesion force of 200 Lb applied @ ambient temp.	<14.5 Psi	No detrimental effect on sealability observed during thermal cycling 8Psi	Pass				
Gasket Adhesion		Maximum adhesion force of 200 Lb applied @ambient temp.	ASTM F 607	No tearing Pickoff of gasket	Pass				

## **Gasket Installation**

In a flanged connection, all components must be correct to achieve a seal. The most common cause of leaky gasketed joints is improper installation of gaskets.

### **KAMMPROFILE IDENTIFICATION REQUIREMENTS**



## **Bolting Procedures**

- Place the gasket on the flange surface to be sealed.
- Bring the opposing flange into contact with the gasket.
- Bolts must be new or in as-new condition. Clean the threads and lubricate them with a quality lubricant, such as an oil and graphite mixture.
- Place the bolts into the bolt holes.
- Finger-tighten the nuts.
- Follow the bolting sequence in the diagrams above.
- During the initial tightening sequence, do not tighten any bolts more than 30% of the recommended bolt stress. Doing so will cause cocking of the flange and the gasket will be crushed.
- Upon reaching the recommended torque requirements, do a circular bolt-to-bolt

torque check to make certain that the bolts have been stressed evenly.

Due to creep and stress relaxation, it is essential to prestress the bolts to ensure adequate stress load during operation.



4 - BOLT FLAGE





## Torque table Kamprofile

### **TORQUE TABLES**

These tables were developed to be used with Kammprofile Gaskets. They are to be used only as a general guide. They should not be considered to contain absolute values due to the large number of uncontrollable variables involved with bolted joints.

All bolt torque values are based upon the use of new nuts (ASTM A194, GR 2H) and new bolts (ASTM A193, GR B7) of proper design, acceptable quality and approved materials of construction as well as metallurgy. It is also required that two hardened steel washers be used under the head of each nut and that a thread lubricant (i.e. oil and graphite) be used on the nuts, bolts and washers.

The flanges are assumed to be in good condition and in compliance with ASME B16.5 specifications. Special attention should be given to seating surface finish and flatness. Only torque wrenches that have been calibrated should be used. The proper bolt tightening pattern must be followed with the desired ultimate torque value arrived at in a minimum of three equal increments. All bolts in the flange should then be checked in consecutive bolt-to-bolt order.

The contact dimensions listed are taken from the ID and OD of the windings, which are different from the ASME ring gasket dimensions.

No provisions have been made in these tables to account for vibration effects on the bolts. These tables are based on ambient conditions, without compensation for elevated temperatures.

Nom. Pipe Size (inches)	No. of Bolts	Size of Bolts	Minimum Torque (ft.lbs) 150	Preferred Torque (ft.lbs) 150	Minimum Torque (ft.lbs) 300	Preferred Torque (ft.lbs) 300	Minimum Torque (ft.lbs) 400	Preferred Torque (ft.lbs) 400	Minimum Torque (ft.lbs) 600	Preferred Torque (ft.lbs) 600	Minimum Torque (ft.lbs) 900	Preferred Torque (ft.lbs) 900	Minimum Torque (ft.lbs) 1500	Preferred Torque (ft.lbs) 1500	Minimum Torque (ft.lbs) 2500	Preferred Torque (ft.lbs) 2500
0.50	4	0.50	8	42	8	42	8	42	8	42	12	100	20	100	20	100
0.75	4	0.50	11	54	14	68	14	68	14	68	15	100	25	100	25	100
1	4	0.50	13	60	17	84	17	84	17	84	22	160	36	160	36	160
1.25	4	0.50	24	60	30	120	30	120	30	120	39	193	64	193	75	245
1.5	4	0.50	31	60	43	200	43	200	43	200	58	289	96	289	106	355
2	4	0.63	55	120	27	120	27	120	27	120	35	176	59	176	68	245
2.5	4	0.63	63	120	35	177	35	177	35	177	47	245	79	245	87	355
3	4	0.63	102	120	57	200	57	200	57	200	66	328	140	419	154	500
4	8	0.63	76	120	84	200	97	320	97	320	124	622	229	686	242	800
5	8	0.75	106	200	106	200	123	320	143	490	173	865	305	915	406	1500
6	8	0.75	137	200	92	200	106	320	123	490	135	675	272	815	574	2200
8	8	0.75	190	200	146	320	170	490	187	710	225	1127	418	1253	529	2200
10	12	0.88	178	320	155	490	170	710	188	938	205	1026	673	2018	794	4400
12	12	0.88	178	320	171	710	188	941	151	753	165	824	484	2200	875	5920
14	12	1.00	268	490	177	710	195	975	213	1066	206	1031	701	3180	-	-
16	16	1.00	267	490	259	1000	283	1360	274	1370	315	1575	1027	4400	-	-
18	16	1.13	381	710	280	1000	306	1360	409	2044	542	2710	1464	5920	-	-
20	20	1.13	335	710	308	1000	326	1600	375	1875	540	2850	1748	7720	-	-
24	20	1.25	438	1000	386	1600	513	2566	588	2040	833	4400	2516	13000	-	-

#### Notes:

Torque values limit minimum and maximum gasket seating stresses based upon pressure class and certain operating conditions.(i.e: maximum pressure ratings for given pressure class, not hydrotest pressure). Extreme operating conditions such as high temperature may reduce bolt yield strength. Caution should be used in these applications. The above torque values are for general use only. For critical or extreme applications (high temperature/pressure) consult with Goodrich engineering.

# Dimensional Chart Kamprofile





#### ASME B16.20

NOMINAL BORE		SEALING	SEALING	CENTERING RING OUTER DIAMETER											
INCHES	ММ	DIAMETER	DIAMETER	150 Class	300 Class	400 Class	600 Class	900 Class	1500 Class	2500 Class					
1⁄2	15	23.1	33.3	47.8	54.1	Note(2)	54.1	Note(3)	63.5	69.9					
3/4	20	28.7	39.6	57.2	66.8	Note(2)	66.8	Note(3)	69.9	76.2					
1	25	36.6	47.5	66.8	73.2	Note(2)	73.2	Note(3)	79.5	85.9					
1¼	32	44.5	60.2	76.2	82.6	Note(2)	82.6	Note(3)	88.9	104.9					
1½	40	52.3	69.9	85.9	95.3	Note(2)	95.3	Note(3)	98.6	117.6					
2	50	69.9	88.9	104.9	111.3	Note(2)	111.3	Note(3)	143.0	146.1					
2½	65	82.6	101.6	124	130.3	Note(2)	130.3	Note(3)	165.1	168.4					
3	80	98.3	123.7	136.7	149.4	Note(2)	149.4	168.4	174.8	196.9					
4	100	123.7	153.9	174.8	181.1	177.8	193.8	206.5	209.6	235.0					
5	125	150.9	182.6	196.9	215.9	212.9	241.3	247.7	254.0	279.4					
6	150	177.8	212.6	222.3	251	247.7	266.7	289.1	282.7	3175					
8	200	228.6	266.7	279.4	308.1	304.8	320.8	358.9	352.6	387.4					
10	250	282.7	320.8	339.9	362	358.9	400.1	435.1	435.1	476.3					
12	300	339.6	377.7	409.7	422.4	419.1	457.2	498.6	520.7	549.4					
14	350	371.6	409.7	450.9	485.9	482.6	492.3	520.7	577.9	Note (4)					
16	400	422.4	466.6	514.4	539.8	536.7	565.2	574.8	641.4	Note (4)					
18	450	479.3	530.1	549.4	596.9	593.9	612.9	638.3	704.9	Note (4)					
20	500	530.1	580.9	606.6	654.1	647.7	682.8	698.5	755.7	Note (4)					
24	600	631.7	682.5	717.6	774.7	768.4	790.7	838.2	901.7	Note (4)					

#### **GENERAL NOTES**

Dimensions in mm. Tolerances in mm.

Figures stated are for information only. Please refer to the

current version of the original standards for dimensional information.

#### NOTES

1) Tolerances +/- 0.8mm for all diameters

2) There is no Class 400 flanges in NPS ½" through NPS 3" (use Class 600)

3) There is no Class 900 flanges in NPS ½" through NPS 2.½" (use Class 1500)

4) There is no Class 2500 flanges in NPS 14" and larger

# **Dimensional Chart** Kammprofile





ASME B16.47 SERIES A

NORMA	L BORE	SEALING INNER	SEALING OUTER	CENTERING RING OUTER DIAMETER		DIAMETER										
INCHES	мм	150	150	300	300	400	400	600	600	900	900	150	300	400	600	900
26	650	673.1	704.9	685.8	736.6	685.8	736.6	685.8	736.6	685.8	736.6	774.7	835.2	831.9	866.9	882.7
28	700	723.9	755.7	736.6	787.4	736.6	787.4	736.6	787.4	736.6	787.4	831.9	898.7	892.3	914.4	946.2
30	750	774.7	806.5	793.8	844.6	793.8	844.6	793.8	844.6	793.8	844.6	882.7	952.5	946.2	971.6	1009.7
32	800	825.5	860.6	850.9	901.7	850.9	901.7	850.9	901.7	850.9	901.7	939.8	1006.6	1003.3	1022.4	1073.2
34	850	876.3	911.4	901.7	952.5	901.7	952.5	901.7	952.5	901.7	925.5	990.6	1057.4	1054.1	1073.2	1136.7
36	900	927.1	968.5	955.8	1006.6	955.8	1006.6	955.8	1006.6	958.9	1009.7	1047.8	1117.6	1117.6	1130.3	1200.2
38	950	977.9	1019.3	977.9	1016.0	971.6	1022.4	990.6	1041.4	1035.1	1085.9	1111.3	1054.1	1073.2	1104.9	1200.2
40	1000	1028.7	1070.1	1022.4	1070.1	1025.7	1076.5	1047.8	1098.6	1098.6	1149.4	1162.1	1114.6	1127.3	1155.7	1251.0
42	1050	1079.5	1124.0	1073.2	1120.9	1076.5	1127.3	1104.9	1155.7	1149.4	1200.2	1219.2	1165.4	1178.1	1219.2	1301 8
44	1100	1130.3	1178.1	1130.3	1181.1	1130.3	1181.1	1162.1	1212.9	1206.5	1257.3	1276.4	1219.2	1231.9	1270.0	1368.6
46	1150	1181.1	1228.9	1178.1	1228.9	1193.8	1244.6	1212.9	1263.7	1270.0	1320.8	1327.2	1273.3	1289.1	1327.2	1435.1
48	1200	1231.9	1279.7	1235.2	1286.0	1244.6	1295.4	1270.0	1320.8	1320.8	1371.6	1384.3	1324.1	1346.2	1390.7	1485.9
50	1250	1282.7	1333.5	1295 4	1346.2	1295.4	1346.2	1320.8	1371.6	Note (4)	Note (4)	1435.1	1378.0	1403.4	1447.8	Note (4)
52	1300	1333.5	1384.3	1346.2	1397.0	1346.2	1397.0	1371.6	1422.4	Note (4)	Note (4)	1492.3	1428.8	1454.2	1498.6	Note (4)
54	1350	1384.3	1435.1	1403.4	1454.2	1403.4	1454.2	1428.8	1479.6	Note (4)	Note (4)	1549.4	1492.3	1517.7	1555.8	Note (4)
56	1400	1435.1	1485.9	1454.2	1505.0	1454.2	1505.0	1479.6	1530.4	Note (4)	Note (4)	1606.6	1543.1	1568.5	1612.9	Note (4)
58	1450	1485.9	1536.7	1511.3	1562.1	1505.0	1555.8	1536.7	1587.5	Note (4)	Note (4)	1663.7	1593.9	1619.3	1663.7	Note (4)
60	1500	1536.7	1587.5	1562.1	1612.9	1568.5	1619.3	1593.9	1644.7	Note (4)	Note (4)	1714.5	1644.7	1682.8	1733.6	Note (4)

#### **GENERAL NOTES**

Dimensions in mm. Tolerances in mm.

Figures stated are for information only. Please refer to the

current version of the original standards for dimensional information.

#### NOTES

2) Sealing ID Nom Bore 26 to 34 tolerances +/- 0.8mm and Nom Bore 36 to 60 +/- 1.5mm
 2) Sealing OD Nom Bore 26 to 60 tolerances +/- 1.5mm
 3) Centering Ring OD tolerances +/- 0.8mm

4) There are no Class 900 flanges NPS 50" and above. tt

# **Dimensional Chart** Kammprofile





ASME B16.47 SERIES B

NORMA	L BORE	SEALING INNER	SEALING OUTER	CENTERING RING OUTER DIAMETER		DIAMETER										
INCHES	ММ	150	150	300	300	400	400	600	600	900	900	150	300	400	600	900
26	650	673.1	698.5	673.1	711.2	666.8	698.5	663.7	714.5	692.2	749.3	725.4	771.7	746.3	765.3	838.2
28	700	723.9	749.3	723.9	762.0	714.5	749.3	704.9	755.7	743.0	800.1	776.2	825.5	800.1	819.2	901.7
30	750	774.7	800.1	774.7	812.8	765.3	806.5	778.0	828.8	806.5	857.3	827.0	886.0	857.3	879.6	958.9
32	800	825.5	850.9	825.5	863.6	812.8	860.6	831.9	882.7	863.6	914.4	881.1	939.8	911.4	933.5	1016.0
34	850	876.3	908.1	876.3	914.4	866.9	911.4	889.0	939.8	920.8	971.6	935.0	993.9	962.2	997.0	1073.2
36	900	927.1	958.9	927.1	965.2	917.7	965.2	939.8	990.6	946.2	997.0	987.6	1047.8	1022.4	1047.8	1124.0
38	950	974.9	1009.7	1009.7	1047.8	971.6	1022.4	990.6	1041.4	1035.1	1085.9	1044.7	1098.6	1073.2	1104.9	1200.2
40	1000	1022.4	1063.8	1060.5	1098.6	1025.7	1076.5	1047.8	1098.6	1098.6	1149.4	1095.5	1149.4	1127.3	1155.7	1251.0
42	1050	1079.5	1114.6	1111.3	1149.4	1076.5	1127.3	1104 9	1155.7	1149.4	1200.2	1146.3	1200.2	1178.1	1219.2	1301.8
44	1100	1124.0	1165.4	1162.1	1200.2	1130.3	1181.1	1162.1	1212.9	1206.5	1257.3	1197.1	1251.0	1231.9	1270.0	1368.6
46	1150	1181.1	1224.0	1216.2	1254.3	1193.8	1244.6	1212.9	1263.7	1270.0	1320.8	1255.8	1317.8	1289.1	1327.2	1435.1
48	1200	1231.9	1270.0	1263.7	1311.4	1244.5	1295.4	1270.0	1320.8	1320.8	1371.6	1306.6	1368.6	1346.2	1390.7	1485.9
50	1250	1282.7	1325.6	1317.8	1355.9	1295.4	1346.2	1320.8	1371.6	Note (4)	Note (4)	1357.4	1419.4	1403.4	1447.8	Note (4)
52	1300	1333.5	1376.4	1368.6	1406.7	1346.2	1397.0	1371.6	1422.4	Note (4)	Note (4)	1408.2	1470.2	1454.2	1498.6	Note (4)
54	1350	1384.3	1422.4	1403.4	1454.2	1403.4	1454.2	1428.8	1479.6	Note (4)	Note (4)	1463.8	1530.4	1517.7	1555.8	Note (4)
56	1400	1444.8	1478.0	1479.6	1524.0	1454.2	1505.0	1479.6	1530.4	Note (4)	Note (4)	1514.6	1593.9	1568.5	1612.9	Note (4)
58	1450	1500.6	1528.8	1535.2	1573.3	1505.0	1555.8	1536.7	1587.5	Note (4)	Note (4)	1579.6	1655.8	1619.3	1663.7	Note (4)
60	1500	1557.3	1586.0	1589.0	1630.4	1568.5	1619.3	1593.9	1644.7	Note (4)	Note (4)	1630.4	1706.6	1682.8	1733.6	Note (4)

#### **GENERAL NOTES**

Dimensions in mm. Tolerances in mm.

Figures stated are for information only. Please refer to the

current version of the original standards for dimensional information.

#### NOTES

2) Sealing ID Nom Bore 26 to 34 tolerances +/- 0.8mm and Nom Bore 36 to 60 +/- 1.5mm
 2) Sealing OD Nom Bore 26 to 60 tolerances +/- 1.5mm
 3) Centering Ring OD tolerances +/- 0.8mm

4) There are no Class 900 flanges NPS 50" and above. tt



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