

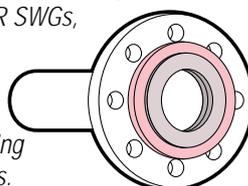


KLINGER

Spiral Wound Gaskets

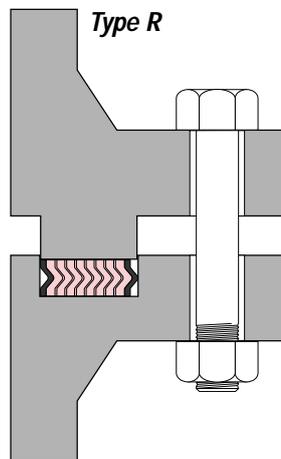
Certified Fire Safe According to API 6FB!

*Summary of the eight versions
of KLINGER SWGs,
the design
principle,
materials
and mounting
instructions.*

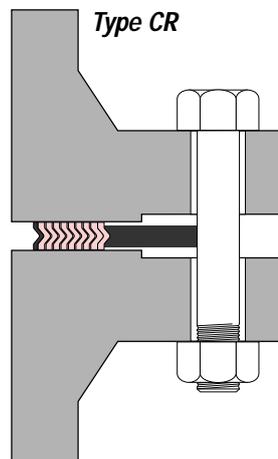


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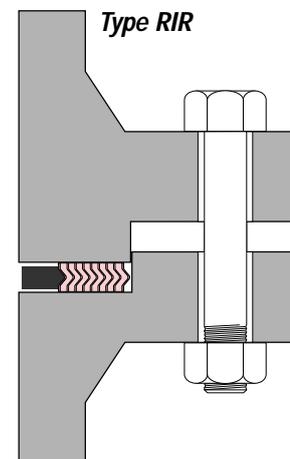
Spiral-Wound Gaskets

**Type R**

Wide choice of materials for metal strip and filler.
Suitable for high pressures and temperatures.
Recommended for flanges with tongue and groove.

**Type CR**

Solid metal outer ring used as a centering device and compression stop.
Used on raised face and flat face flanges.

**Type RIR**

Solid metal inner ring.
Use with high pressures and temperatures.
Male to female flanges.

Standard Metal strip materials

1.4301	304
1.4401	316
1.4404	316 L
1.4541	321
1.4571	316 Ti

Gasket thicknesses

Nominal thickness	Compressed thickness	Guide ring thickness
3.2 mm	2.3 - 2.5 mm	2 - 2.2 mm
4.5 mm	3.2 - 3.4 mm	3 - 3.3 mm
7.2 mm	5.0 - 5.5 mm	5 - 5.5 mm

Special version:

Monel 400[®], InConel 600[®], InConel 625[®], InConel X750[®],
Nickel 200[®], Titanium, Incoloy 800[®], Incoloy 825[®]
Other materials on request

The design principle of the KLINGER Spiral-Wound Gaskets

The basic element of every gasket is the wound core. The V-shaped metal strip is spirally wound with the soft-material filler.

To improve the mechanical strength and other sealing characteristics, some layers at the beginning and at the end are wound without soft material and spot-welded over the total circumference.

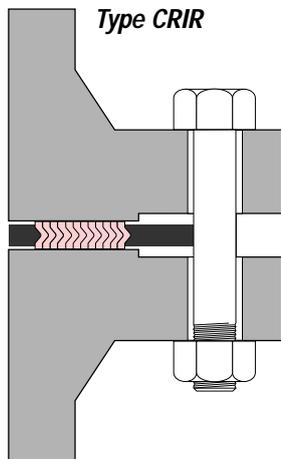
The constant tensile force during the complete winding process permits a defined, constant thickness of the structure.

This gives the gasket recovery forces which provide for a reliable surface load even at fluctuating operating conditions.

In the present 8 versions, the basic element is added by inner and/or outer rings as needed.

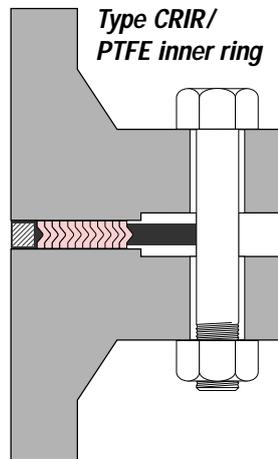
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Spiral-Wound Gaskets



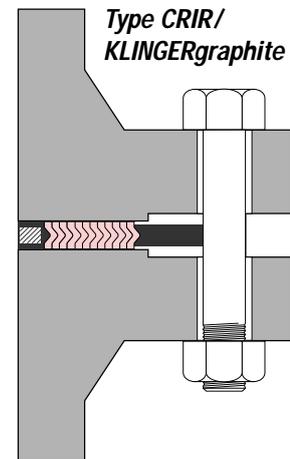
Type CRIR

Solid metal outer and inner rings.
For use at high pressures and temperatures.
Suitable for raised face or flat face flanges.
Prevents turbulences and protects the flanges from erosion.
Protects the inner windings of the gasket element from high temperatures.



**Type CRIR/
PTFE inner ring**

Solid metal outer ring, PTFE inner ring.
Suitable for raised face or flat face flanges.
PTFE inner ring acts as an additional gasket and protects the inner windings of the gasket element from the fluid.



**Type CRIR/
KLINGERgraphite inner ring**

Solid metal inner ring with KLINGERgraphite facing.
For use at high pressures and temperatures.
Suitable for raised face or flat face flanges.
Suitable for corrosive media.
Graphite inner ring acts as an additional gasket.

Standard materials outer ring

Carbon steel,
colour-powder coated
Stainless steel
acc. to the standard metal strip
materials

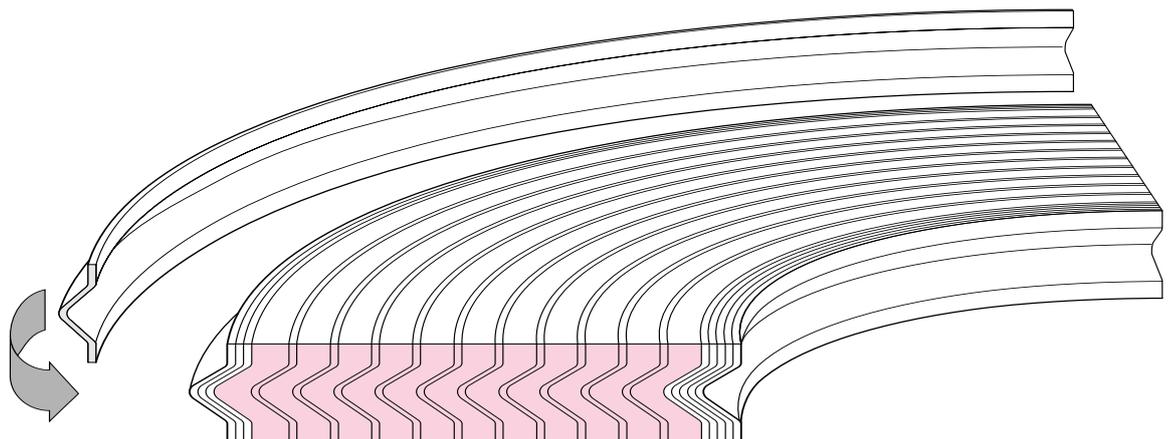
Standard materials inner ring

Stainless steel
acc. to the standard metal strip
materials

Fillers and temperature limits

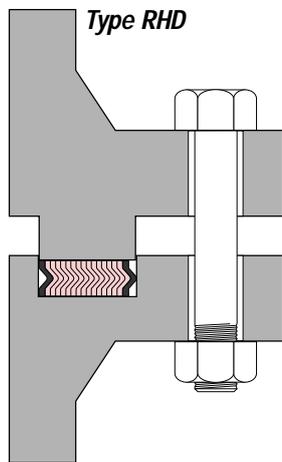
Ceramics	approx. 800°C
KLINGERgraphite*	approx. 500°C
PTFE	approx. 260°C
Mica	approx. 900°C

*pure graphite standard 98% purity
or 99.85% nuclear grade



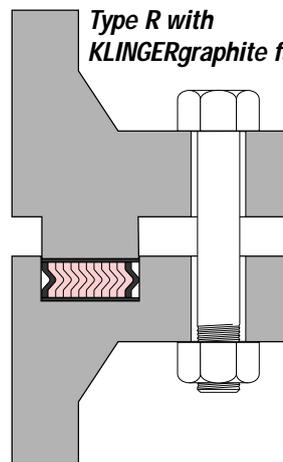
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Spiral-Wound Gaskets



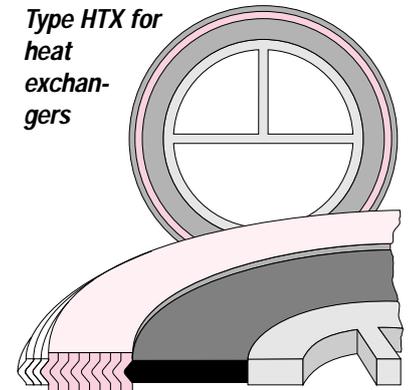
Type RHD

*Spiral wound sealing element.
Wound high density.
Wide choice of materials for metal strip and filler material.
For use in high-pressure pumps, high-pressure valves and gas applications.
Low emission tested.*



**Type R with
KLINGERgraphite facing**

*KLINGERgraphite facing 0.5 mm.
For use in manhole gaskets.
Suitable for use with low bolt loads and uneven gasket surfaces.
Double sealing effect.*



**Type HTX for
heat
exchangers**

*Combined inner and outer rings.
The inner ring could have pass bars or could carry either a metal clad or soft gasket with pass bars.*

Recommended sealing strip roughness

These gaskets are capable of giving an excellent seal over a wide range of flange surface finishes.

However, as a general guide we recommend the following:

R_a micrometer

<i>general</i>	<i>3.2 – 5.1</i>
<i>critical</i>	<i>3.2</i>
<i>vacuum</i>	<i>2.0</i>

(Larger flange surface finishes require higher bolt loads)

*Subject to technical alterations.
Status: April 1999*

Mounting Instructions

The principle

The spiral wound function is based on the metal winding/ filler relationship and the flange surfaces.

The surface roughness should be approx. R_a 3.2 μm . These gaskets can be used in flanges with larger surface roughnesses, but in this case the bolt loads should be increased so as to ensure proper function of the gasket.

When the gasket is compressed during mounting, the homogeneous filler „flows“ into the irregularities of the flange. The metal windings enclose the filler and, at the same time, ensure the strength and elasticity of the gasket.

If the gasket is equipped with a PTFE filler it must have an inner ring since the PTFE permits no further compression, as is the case with other fillers. On the one hand, it prevents the gasket from springing open and on the other, penetration of the flowing PTFE in the pipeline. The larger the surface roughnesses in the flange surface, the larger the surface load required to permit a flow of the PTFE in the irregularities.

Mounting

Flange surface condition:

1. metallicly clean
2. plane-parallel
3. dry
4. fat free

Do not use separating agents or sealing aids!

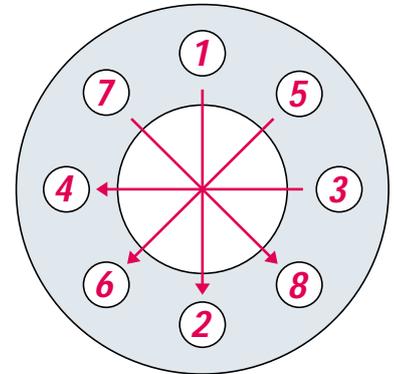
Mounting

The bolts should be free of damage and lubricated with high-temperature resistant greases before mounting.

Insert the gasket and fasten bolts finger-tight.

Next, tighten the bolts crosswise (see sketch) in at least 3 to 4 passes. The more passes you perform, the more uniform the force which is introduced into the flange-gasket system.

In the last pass, the bolts must be tightened only clockwise.



All information is provided in accordance with the current state of knowledge. As we cannot influence the specific application conditions, we would ask you to consider this as a non-binding recommendation.

We can assume no liability for any resulting damage.

KLINGER reserve the right to technical modifications.

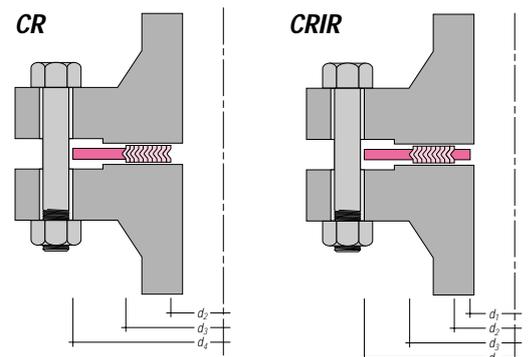
KLINGER SWG types CR/CRIR

Suitable for flanges in accordance with DIN and BS 4504,
measures in mm

DN	d_2		d_3		d_4							
	10 – 320	10 – 320	PN 10 – 40	PN 64 – 320	10	16	25	40	64	100	160	250
10	18	24	36	36	46	46	46	46	56	56	56	67
15	22	28	40	40	51	51	51	51	61	61	61	72
20	27	33	47	47	61	61	61	61	74	74	74	79
25	34	40	54	54	71	71	71	71	82	82	82	82
32	43	49	65	65	82	82	82	82	90	90	90	100
40	48	54	70	70	92	92	92	92	102	102	102	108
50	57	66	84	84	107	107	107	107	112	118	118	123
65	73	82	102	104	127	127	127	127	137	143	143	153
80	86	95	115	119	142	142	142	142	147	153	153	170
100	108	120	140	144	162	162	167	167	173	180	180	202
125	134	146	168	172	192	192	193	193	210	217	217	242
150	162	174	196	200	217	217	223	223	247	257	257	284
175	183	195	221	227	247	247	253	265	277	287	284	316
200	213	225	251	257	272	272	283	290	309	324	324	358
250	267	286	307	315	327	328	340	352	364	391	388	442
300	318	337	358	366	377	383	400	417	424	458	458	538
350	363	382	405	413	437	443	457	474	486	512	–	–
400	414	433	458	466	488	495	514	546	543	572	–	–
500	518	537	566	574	593	617	624	628	657	704	–	–
600	618	637	666	674	695	734	731	747	764	813	–	–
700	718	737	770	778	810	804	833	852	879	–	–	–
800	818	837	874	882	917	911	942	974	988	–	–	–
900	910	930	974	982	1017	1011	1042	1084	1108	–	–	–
1000	1010	1030	1078	1086	1124	1128	1154	1194	1220	–	–	–
1200	1210	1230	1280	1290	1341	1342	1364	1398	1452	–	–	–
1400	1420	1450	1510	–	1548	1542	1578	1618	–	–	–	–
1600	1630	1660	1720	–	1772	1764	1798	1830	–	–	–	–
1800	1830	1860	1920	–	1972	1964	2000	–	–	–	–	–
2000	2020	2050	2120	–	2182	2168	2230	–	–	–	–	–
2200	2230	2260	2330	–	2384	2378	–	–	–	–	–	–
2400	2430	2460	2530	–	2594	–	–	–	–	–	–	–
2600	2630	2660	2730	–	2794	–	–	–	–	–	–	–
2800	2830	2860	2930	–	3014	–	–	–	–	–	–	–
3000	3030	3060	3130	–	3228	–	–	–	–	–	–	–

Subject to technical alterations.
Status: April 1999

**Certified according to
DIN EN ISO 9001.**



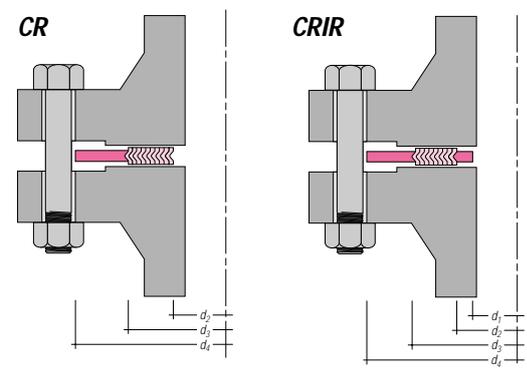


KLINGER SWG types CR/CRIR

Gaskets in accordance with ASME B 16.20,
flanges according ANSI B 16.5, measures in inch

Nominal width	d_3		d_2							d_4						
	\varnothing_A of sealing elem.		\varnothing_1 of sealing element							\varnothing_A of centering ring						
	Press. st. [lbs]		Pressure stage [lbs]							Pressure stage [lbs]						
	150	900	150	300	400	600	900	1,500	2,500	150	300	400	600	900	1,500	2,500
1/4	7/8	—	1/2	1/2	1/2	1/2	—	—	—	1 3/4	1 3/4	1 3/4	1 3/4	—	—	—
1/2	1 1/4	1 1/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1 7/8	2 1/8	2 1/8	2 1/8	2 1/2	2 1/2	2 3/4
3/4	1 9/16	1 9/16	1	1	1	1	1	1	1	2 1/4	2 5/8	2 5/8	2 5/8	2 3/4	2 3/4	3
1	1 7/8	1 7/8	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2 5/8	2 7/8	2 7/8	2 7/8	3 1/8	3 1/8	3 3/8
1 1/4	2 3/8	2 3/8	1 7/8	1 7/8	1 7/8	1 7/8	1 9/16	1 9/16	1 9/16	3	3 1/4	3 1/4	3 1/4	3 1/2	3 1/2	4 1/8
1 1/2	2 3/4	2 3/4	2 1/8	2 1/8	2 1/8	2 1/8	1 7/8	1 7/8	1 7/8	3 3/8	3 3/4	3 3/4	3 3/4	3 7/8	3 7/8	4 5/8
2	3 3/8	3 3/8	2 3/4	2 3/4	2 3/4	2 3/4	2 5/16	2 5/16	2 5/16	4 1/8	4 3/8	4 3/8	4 3/8	5 5/8	5 5/8	5 3/4
2 1/2	3 7/8	3 7/8	3 1/4	3 1/4	3 1/4	3 1/4	2 3/4	2 3/4	2 3/4	4 7/8	5 1/8	5 1/8	5 1/8	6 1/2	6 1/2	6 5/8
3	4 3/4	4 3/4	4	4	4	4	3 3/4	3 5/8	3 5/8	5 3/8	5 7/8	5 7/8	5 7/8	6 5/8	6 7/8	7 3/4
3 1/2	5 1/4	5 1/4	4 1/2	4 1/2	4 1/8	4 1/8	4 1/8	4 1/8	—	6 3/8	6 1/2	6 3/8	6 3/8	7 1/2	7 3/8	—
4	5 7/8	5 7/8	5	5	4 3/4	4 3/4	4 3/4	4 5/8	4 5/8	6 7/8	7 1/8	7	7 5/8	8 1/8	8 1/4	9 1/4
4 1/2	6 1/2	6 1/2	5 1/2	5 1/2	5 5/16	5 5/16	5 5/16	5 5/16	—	7	7 3/4	7 5/8	8 1/4	9 3/8	9 1/8	—
5	7	7	6 1/8	6 1/8	5 13/16	5 13/16	5 13/16	5 5/8	5 5/8	7 3/4	8 1/2	8 3/8	9 1/2	9 3/4	10	11
6	8 1/4	8 1/4	7 3/16	7 3/16	6 7/8	6 7/8	6 7/8	6 3/4	6 3/4	8 3/4	9 7/8	9 3/4	10 1/2	11 3/8	11 1/8	12 1/2
8	10 3/8	10 1/8	9 3/16	9 3/16	8 7/8	8 7/8	8 3/4	8 1/2	8 1/2	11	12 1/8	12	12 5/8	14 1/8	13 7/8	15 1/4
10	12 1/2	12 1/4	11 5/16	11 5/16	10 13/16	10 13/16	10 7/8	10 1/2	10 5/8	13 3/8	14 1/4	14 1/8	15 3/4	17 1/8	17 1/8	18 3/4
12	14 3/4	14 1/2	13 3/8	13 3/8	12 7/8	12 7/8	12 3/4	12 3/4	12 1/2	16 1/8	16 5/8	16 1/2	18	19 5/8	20 1/2	21 5/8
14	16	15 3/4	14 5/8	14 5/8	14 1/4	14 1/4	14	14 1/4	—	17 3/4	19 1/8	19	19 3/8	20 1/2	22 3/4	—
16	18 1/4	18	16 5/8	16 5/8	16 1/4	16 1/4	16 1/4	16	—	20 1/4	21 1/4	21 1/8	22 1/4	22 5/8	25 1/4	—
18	20 3/4	20 1/2	18 11/16	18 11/16	18 1/2	18 1/2	18 1/4	18 1/4	—	21 5/8	23 1/2	23 3/8	24 1/8	25 1/8	27 3/4	—
20	22 3/4	22 1/2	20 11/16	20 11/16	20 1/2	20 1/2	20 1/2	20 1/4	—	23 7/8	25 3/4	25 1/2	26 1/8	27 1/2	29 3/4	—
24	27	26 3/4	24 3/4	24 3/4	24 3/4	24 3/4	24 3/4	24 1/4	—	28 1/4	30 1/2	30 1/4	31 1/8	33	35 1/2	—

Subject to technical alterations.
Status: October 2000



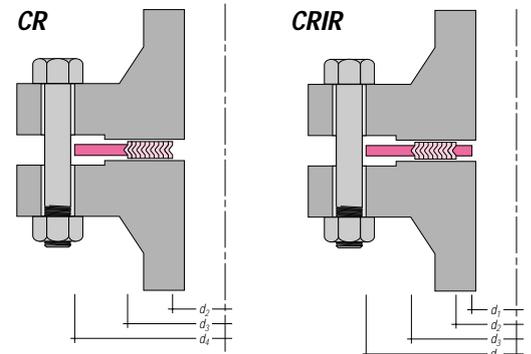
**Certified according to
DIN EN ISO 9001.**

KLINGER SWG types CR/CRIR

Gaskets in accordance with ASME B 16.20,
flanges according ANSI B 16.5, measures in mm

Nominal width	d_3		d_2							d_4						
	\varnothing_A of sealing elem.		\varnothing_1 of sealing element							\varnothing_A of centering ring						
	Press. st. [lbs]		Pressure stage [lbs]							Pressure stage [lbs]						
	150	900	150	300	400	600	900	1,500	2,500	150	300	400	600	900	1,500	2,500
1/4	22.2	—	12.7	12.7	12.7	12.7	—	—	—	44.5	44.5	44.5	44.5	—	—	—
1/2	31.8	31.8	19.1	19.1	19.1	19.1	19.1	19.1	19.1	47.8	54.1	54.1	54.1	63.5	63.5	69.9
3/4	39.6	39.6	25.4	25.4	25.4	25.4	25.4	25.4	25.4	57.2	66.8	66.8	66.8	69.9	69.9	76.2
1	47.8	47.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	66.8	73.2	73.2	73.2	79.5	79.5	85.9
1 1/4	60.5	60.5	47.8	47.8	47.8	47.8	39.6	39.6	39.6	76.2	82.6	82.6	82.6	88.9	88.9	104.9
1 1/2	69.9	69.9	54.1	54.1	54.1	54.1	47.8	47.8	47.8	85.9	95.3	95.3	95.3	98.6	98.6	117.6
2	85.9	85.9	69.9	69.9	69.9	69.9	58.7	58.7	58.7	104.9	111.3	111.3	111.3	143.0	143.0	146.1
2 1/2	98.6	98.6	82.6	82.6	82.6	82.6	69.9	69.9	69.9	124.0	130.3	130.3	130.3	165.1	165.1	168.4
3	120.7	120.7	101.6	101.6	101.6	101.6	95.3	92.2	92.2	136.7	149.4	149.9	149.4	168.4	174.8	196.9
3 1/2	133.4	133.4	114.3	114.3	104.8	104.8	104.8	104.8	—	161.9	165.1	161.9	161.9	190.5	187.3	—
4	149.4	149.4	127.0	127.0	120.7	120.7	120.7	117.6	117.6	174.8	181.1	177.8	193.8	206.5	209.6	235.0
4 1/4	165.1	165.1	139.7	139.7	134.9	134.9	134.9	134.9	—	177.8	196.9	193.7	209.6	238.1	231.8	—
5	177.8	177.8	155.7	155.7	147.6	147.6	147.6	143.0	143.0	196.9	215.9	212.9	241.3	247.7	254.0	279.4
6	209.6	209.6	182.6	182.6	174.8	174.8	174.8	171.5	171.5	222.3	251.0	247.7	266.7	289.1	282.7	317.5
8	263.7	257.3	233.4	233.4	225.6	225.6	222.3	215.9	215.9	279.4	308.1	304.8	320.8	358.9	352.6	387.4
10	317.5	311.2	287.3	287.3	274.6	274.6	276.4	266.7	270.0	339.9	362.0	358.9	400.1	435.1	435.1	476.3
12	374.7	368.3	339.9	339.9	327.2	327.2	323.9	323.9	317.5	409.7	422.4	419.1	457.2	498.6	520.7	549.4
14	406.4	400.1	371.6	371.6	362.0	362.0	355.6	362.0	—	450.9	485.9	482.6	492.3	520.7	577.9	—
16	463.6	457.2	422.4	422.4	412.8	412.8	412.8	406.4	—	514.4	539.8	536.7	565.2	574.8	641.4	—
18	527.1	520.7	474.7	474.7	469.9	469.9	463.6	463.6	—	549.4	596.9	593.9	612.9	638.3	704.9	—
20	577.9	571.5	525.5	525.5	520.7	520.7	520.7	514.4	—	606.6	654.1	647.7	682.8	698.5	755.7	—
24	685.8	679.5	628.7	628.7	628.7	628.7	628.7	616.0	—	717.6	774.7	768.4	790.7	833.2	901.7	—

Subject to technical alterations.
Status: October 2000



Certified according to
DIN EN ISO 9001.

KLINGER SWG

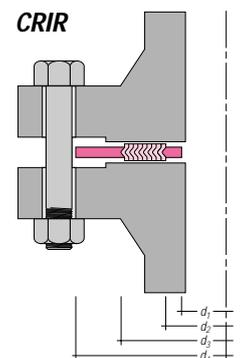
Inner ring dimension

Gaskets according ASME B 16.20, flanges according ANSI B 16.5,
measures in inch/mm

Nominal width	d_1													
	Pressure stage [lbs]													
	150		300		400		600		900		1500		2500	
1/2	9/16	14.3	9/16	14.3	9/16	14.3	9/16	14.3	9/16	14.3	9/16	14.3	9/16	14.3
3/4	13/16	20.7	13/16	20.7	13/16	20.7	13/16	20.7	13/16	20.7	13/16	20.7	13/16	20.7
1	1 1/16	27.0	1 1/16	27.0	1 1/16	27.0	1 1/16	27.0	1 1/16	27.0	1 1/16	27.0	1 1/16	27.0
1 1/4	1 1/2	38.1	1 1/2	38.1	1 1/2	38.1	1 1/2	38.1	1 5/16	33.4	1 5/16	33.4	1 5/16	33.4
1 1/2	1 3/4	44.5	1 3/4	44.5	1 3/4	44.5	1 3/4	44.5	1 5/8	41.3	1 5/8	41.3	1 5/8	41.3
2	2 3/16	55.6	2 3/16	55.6	2 3/16	55.6	2 3/16	55.6	2 1/16	52.4	2 1/16	52.4	2 1/16	52.4
2 1/2	2 5/8	66.7	2 5/8	66.7	2 5/8	66.7	2 5/8	66.7	2 1/2	63.5	2 1/2	63.5	2 1/2	63.5
3	3 3/16	81.0	3 3/16	81.0	3 3/16	81.0	3 3/16	81.0	3 3/16	81.0	3 3/16	81.0	3 13/128	78.7
4	4 3/16	106.4	4 3/16	106.4	4 3/16	106.4	4 3/16	106.4	4 3/16	106.4	4 3/16	106.4	3 109/128	97.8
5	5 3/16	131.8	5 3/16	131.8	5 3/16	131.8	5 3/16	131.8	5 3/16	131.8	5 3/16	131.8	4 115/128	124.5
6	6 3/16	157.2	6 3/16	157.2	6 3/16	157.2	6 3/16	157.2	6 3/16	157.2	6 3/16	157.2	5 51/64	147.3
8	8 1/2	215.9	8 1/2	215.9	8 1/4	209.6	8 1/4	209.6	8 1/4	209.6	8 1/8	206.4	7 3/4	196.9
10	10 9/16	268.3	10 9/16	268.3	10 1/4	260.4	10 1/4	260.4	10 1/4	260.4	10 5/32	258.0	9 11/16	246.1
12	12 1/2	317.5	12 1/2	317.5	12 1/2	317.5	12 1/2	317.5	12 3/8	314.3	12 3/8	314.3	11 1/2	292.1
14	13 3/4	349.3	13 3/4	349.3	13 3/4	349.3	13 3/4	349.3	13 1/2	342.9	13 3/8	339.7	—	—
16	15 3/4	400.0	15 3/4	400.0	15 3/4	400.0	15 3/4	400.0	15 1/2	393.7	15 1/4	387.4	—	—
18	17 11/16	449.3	17 11/16	449.3	17 11/16	449.3	17 11/16	449.3	17 1/2	444.5	17 1/4	438.2	—	—
20	19 11/16	500.0	19 11/16	500.0	19 11/16	500.0	19 11/16	500.0	19 1/2	495.3	19 1/4	489.0	—	—
24	23 3/4	603.3	23 3/4	603.3	23 3/4	603.3	23 3/4	603.3	23 3/4	603.3	22 3/4	577.9	—	—

Subject to technical alterations.

Status: October 2000



**Certified according to
DIN EN ISO 9001.**