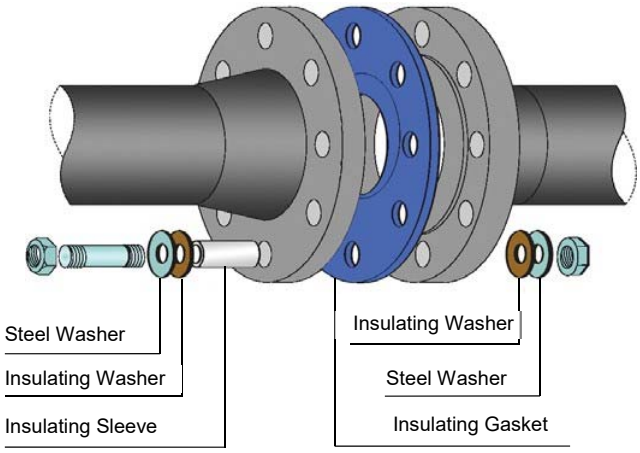
PSE ENGINEERING GMBH

Flange Insulating Kits are used for electrically isolating cathodic protected pipeline sections from unprotected pipelines or other metallic structures.

Gask-O-Seal gaskets are sealings which become effective when the pipes are assembled the first time. The gaskets have an almost unlimited durability and may be removed and re-installed several times.

Gask-O-Seal gaskets are available to fit all international standards, sizes and pressure ratings.



Material	Gaskets A	Gaskets B	Gaskets C	Sleeve Spiral Wound Mylar	Washer High Strength Phenolic
Dielectric strength (V/mm)	20 000	20 000	94 000	4 000	2 000
Compressive strength (N/cm²)	16 900	16 900	14 000		
Flexural strength (N/cm²)	15 820	15 820	highly flexible		
Tensile strength (N/cm²)	17 580	17 580	2 670		
Water absorption (%)	1.6	1.6	5	0.8	1.0
Recommended max. temperature for continuous use (°C)	80	107	316	150	107

Material:

A Neoprene faced Phenolic

B GASKET-SEAL Retainer phenolic laminate with integral nitrile or viton seals

C Red Devil® Style 940 non-asbestos

High temperature materials: max. operating temp.180° C
Retainer: hi-temp. phenolic
Seal element: fluorocarbon

If required, retainers and seals made of other materials can be supplied for special applications (for corrosive liquids, gases, vacuum).

General Information

Gasket-Seals are based on the advantageous principle of O-ring seals, without their characteristic disadvantages. Unlike O-rings, there is no need to provide grooves in the flanges with close tolerances or to align the flanges exactly when assembling them.

Gasket seals are principally made of first-class insulating material. Later on, they may be converted into insulating flanges by incorporating insulating sleeves and washers.

The deformation of the sealing element being predetermined under pressure by the construction of the ring. The synthetic rubber of the element recovers its original form if the flange " breathe " under the pressure in the pipes, that is the crown of the sealing ring remains in uniform contact with the inner flange surfaces, thus ensuring perfect sealing, even in case of pulsating pressure.

The materials for the retainer and the sealing are carefully selected so as to allow their utilization in a wide range of liquids and gases under various operating conditions. Standard-type gaskets can be used up to a maximum operating temperature of 107° C. High temperature types even tolerate temperatures up to 180° C. The pressure capabilities being considerably higher than the test pressure of ANSI 2500 flanges. Gasket-Seals can also be used under lower vacuum conditions.

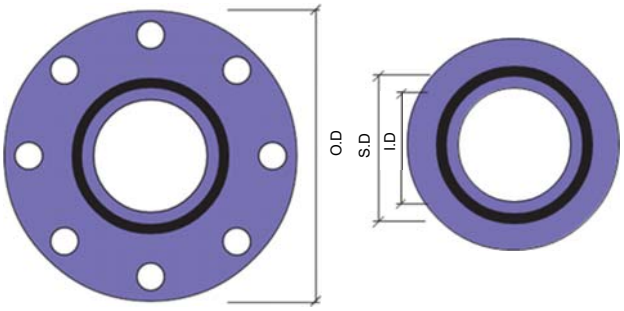
Insulating Kits

Flange Insulating Kits consist of the following:

1 Gasket

Insulating sleeves (qty. according to flange type)
Insulating washers (qty. according to flange type)
Bright steel washers (qty. according to flange type)

Bolts and nuts are not included, but can be delivered on special request.



TYPE E

To avoid electrical contact points Gasket-Seal **TYPE E** are used.

TYPE F

When using **TYPE F**, the outside of flange has to be taped.

No shutdown will be necessary when converting a normal Gasket- Seal into flange insulation. The bolts are removed successively, provided with insulating sleeves and washers, and reinstalled again; the flange coupling being unchanged.

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Flange Insulating Kits (gasket Dimensions)

Nom. Pipe Size	Gasket I.D. thru	Gasket I.D. thru	Gasket O.D. Type E	Gasket O.D. Type F	Seal Ring center line dia.	Seal Ring width	Number and size of bolts ANSI 150	ANSI 300	ANSI 400	ANSI 600	ANSI 900	ANSI 1500	ANSI 2500
1	1 1/16	1	Same as O.D. of flange	Bolt circle less bolt diameter	1.524"	.156	4 – 1/2	4 – 5/8	4 – 5/8	4 – 5/8	4 – 7/8	4 – 7/8	4 – 7/8
1 1/4	1 3/8	1 1/4			1.940"	.156	4 – 1/2	4 – 5/8	4 – 5/8	4 – 5/8	4 – 7/8	4 – 7/8	4 – 1
1 1/2	1 5/8	1 1/2			2.210"	.156	4 – 1/2	4 – 3/4	4 – 3/4	4 – 3/4	4 – 1	4 – 1	4 – 1 1/8
2	2 1/16	1 15/16			2.760"	.156	4 – 5/8	8 – 5/8	8 – 5/8	8 – 5/8	8 – 7/8	8 – 7/8	8 – 1
2 1/2	2 1/2	2 5/16			3.020"	.156	4 – 5/8	8 – 3/4	8 – 3/4	8 – 3/4	8 – 1	8 – 1	8 – 1 1/8
3	3 1/16	2 15/16			3.600"	.156	4 – 5/8	8 – 3/4	8 – 3/4	8 – 3/4	8 – 7/8	8 – 1 1/8	8 – 1 1/4
3 1/2	3 9/16	3 7/16			4.170"	.172	8 – 5/8	8 – 3/4	8 – 7/8	8 – 7/8			
4	4 1/16	3 13/16			4.750"	.172	8 – 5/8	8 – 3/4	8 – 7/8	8 – 7/8	8 – 1 1/8	8 – 1 1/4	8 – 1 1/2
5	5 1/16	4 13/16			5.650"	.172	8 – 3/4	8 – 3/4	8 – 7/8	8 – 1	8 – 1 1/4	8 – 1 1/2	8 – 1 3/4
6	6 1/16	5 3/4			6.720"	.172	8 – 3/4	12 – 3/4	12 – 7/8	12 – 1	12 – 1 1/8	12 – 1 3/8	8 – 2
8	8	7 5/8			8.720"	.172	8 – 3/4	12 – 7/8	12 – 1	12 – 1 1/8	12 – 1 3/8	12 – 1 5/8	12 – 2
10	10 1/16	9 3/4			11.000"	.172	12 – 7/8	16 – 1	16 – 1 1/8	16 – 1 1/4	16 – 1 3/8	12 – 1 7/8	12 – 2 1/2
12	12 1/16	11 3/4			13.500"	.172	12 – 7/8	16 – 1 1/8	16 – 1 1/4	20 – 1 1/4	20 – 1 3/8	16 – 2	16 – 1 3/8
14	13 1/4	13			14.700"	.172	12 – 1	20 – 1 1/8	20 – 1 1/4	20 – 1 3/8	20 – 1 1/2	16 – 2 1/4	
16	15 1/4	15			16.750"	.188	16 – 1	20 – 1 1/4	20 – 1 3/8	20 – 1 1/2	20 – 18	16 – 2 1/2	
18	17 1/4	17			19.000"	.188	16 – 1 1/8	24 – 1 1/4	24 – 1 3/8	20 – 1 5/8	20 – 1 7/8	16 – 2 3/4	
20	19 1/4	19			21.000"	.188	20 – 1 1/8	24 – 1 1/4	24 – 1 1/2	24 – 1 5/8	20 – 2	16 – 3	
22	21 1/4	21			23.250"	.188	20 – 1 1/4	24 – 1 1/2	24 – 1 5/8	24 – 1 3/4			
24	23 1/4	23			25.000"	.188	20 – 1 1/4	24 – 1 1/2	24 – 1 3/4	24 – 1 7/8	20 – 2 1/2	16 – 3 1/2	
26	25 1/4	25			26.500"	.188	24 – 1 1/4	28 – 1 5/8	28 – 1 3/4	28 – 1 7/8	20 – 2 3/4		
28	27 1/4	27			28.500"	.188	28 – 1 1/4	28 – 1 5/8	28 – 1 7/8	28 – 2	20 – 3		
30	29 1/4	29			30.500"	.188	28 – 1 1/4	28 – 1 3/4	28 – 2	28 – 2	20 – 3		
32	31 1/4	31			32.500"	.188	28 – 1 1/2	28 – 1 7/8	28 – 2	28 – 2 1/4	20 – 3 1/4		
34	33 1/4	33			34.500"	.188	32 – 1 1/2	28 – 1 7/8	28 – 2	28 – 2 1/4	20 – 3 1/2		
36	35 1/4	35			36.500"	.250	32 – 1 1/2	32 – 2	32 – 2	28 – 2 1/2	20 – 3 1/2		
40	39 1/4	39			40.500"	.250	36 – 1 1/2	36 – 2	32 – 2 1/2	28 – 2 3/4			
42	41 1/4	41			42.500"	.250	36 – 1 1/2	36 – 2	32 – 2 1/2	28 – 2 3/4			

Pipe Size DN	Type E	Type F	Number and size of bolts according to DIN,ISO and BS 4504 nominal pressure 10	16	25	40	64	100	160	250
10	Same as O.D. of flange	Bolt circle less bolt diameter	4-M12	4-M12	4-M12	4-M12	4-M12	4-M12	4-M12	4-M16
15			4-M12	4-M12	4-M12	4-M12	4-M12	4-M12	4-M12	4-M16
20			4-M12	4-M12	4-M12	4-M12				
25			4-M12	4-M12	4-M12	4-M12	4-M16	4-M16	4-M16	4-M20
32			4-M16	4-M16	4-M16	4-M16				
40			4-M16	4-M16	4-M16	4-M16	4-M20	4-M20	4-M20	4-M24
50			4-M16	4-M16	4-M16	4-M16	4-M20	4-M24	4-M24	8-M24
65			4-M16	4-M16	4-M16	8-M16	8-M20	8-M24	8-M24	8-M24
80			8-M16	8-M16	8-M16	8-M16	8-M20	8-M24	8-M24	8-M27
100			8-M16	8-M16	8-M16	8-M20	8-M24	8-M27	8-M27	8-M30
125			8-M16	8-M16	8-M20	8-M24	8-M27	8-M30	8-M30	12-M30
150			8-M20	8-M20	8-M24	8-M24	8-M30	12-M30	12-M30	12-M33
175				8-M20	8-M24	12-M27	12-M30	12-M30	12-M33	
200			8-M20	12-M20	12-M27	12-M27	12-M33	12-M33	12-M33	12-M39
250			12-M20	12-M24	12-M27	12-M30	12-M33	12-M36	12-M39	16-M45
300			12-M20	12-M24	12-M27	16-M30	16-M33	16-M39	16-M39	
350			16-M20	16-M24	16-M27	16-M33	16-M36	16-M45	16-M45	
400			16-M24	16-M27	16-M30	16-M36	16-M39	16-M45		
450			20-M24	20-M27	16-M33					
500			20-M24	20-M30	20-M33	20-M39	20-M45	20-M52		
600			20-M27	20-M33	20-M33	20-M45	20-M52	20-M56		
700			24-M27	24-M33	20-M36	24-M45	24-M52	24-M64		
800			24-M30	24-M36	24-M39	24-M52	24-M56			
900			28-M30	28-M36	24-M45	28-M52	28-M56			
1000			28-M33	28-M39	28-M45	28-M52	28-M64			
1200			32-M36	32-M45	28-M52	32-M56	32-M72			
1400			36-M39	36-M45		36-M56				

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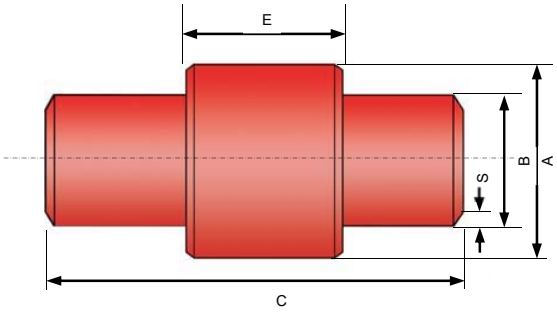
Monobloc Insulating Joints delivered by the company are always manufactured in accordance with the highest technical standards.

Full technical details of the plant to be protected should be supplied by the Customer to permit the most suitable joint for the particular application to be offered.

The **PN** always refer to the maximum pressure for each application, but the following characteristics are always applicable:

- Resistance in air: greater than 5 MΩ
- Testing voltage: 3 000 V - 50 Hz
- Hydraulic test pressure: 1.5 x PN
- Temperature: up to 70° C



Joint Material:

FE 45-1 UNI7088-72
API 5L-5LX

Joints of different material and joints able to operate at pressures higher than ANSI 600, temperatures greater than 70° C, or voltages over 3 kV, can be supplied on request.

DN	B	PN 25 ANSI 150				PN 64 ANSI 300 - 400				PN 100 ANSI 600			
		S	A	C	E	S	A	C	E	S	A	C	E
½ "	21.3	3.25	49	230	34	3.25	60	250	60	3.25	60	250	60
¾ "	26.7	3.91	51	230	35	3.91	65	250	60	3.91	65	250	60
1"	33.4	3.91	58	230	37	3.91	75	250	60	3.91	75	250	60
1 ¼ "	42.4	3.91	70	250	40	3.91	82	300	70	3.91	82	300	70
1 ½ "	48.3	3.91	75	250	42	3.91	95	300	80	3.91	95	300	80
2"	60.3	3.91	88	290	57	3.91	108	350	92	3.91	108	350	92
2 ½ "	76.1	4.78	113	360	63	5.49	114	500	94	5.49	118	500	96
3"	88.9	4.78	127	390	65	5.49	135	500	96	5.49	136	500	105
4"	114.3	4.78	151	440	72	6.02	159	500	108	6.02	166	500	120
5"	141.3	4.78	192	460	89	6.55	194	600	124	6.55	197	600	135
6"	168.3	5.56	217	490	94	7.11	240	600	136	7.11	240	600	149
8"	219.1	6.35	272	540	102	8.18	273	600	158	8.18	293	600	176
10"	273.0	6.35	322	620	115	9.27	350	800	186	9.27	350	800	205
12"	328.8	6.35	380	830	153	9.52	400	1000	206	9.52	406	1000	228
14"	355.6	7.14	430	880	168	10.31	440	1000	228	12.70	450	1000	249
16"	406.4	7.14	483	930	175	12.70	490	1000	244	12.70	505	1000	273
18"	457.4	7.14	525	960	195	12.70	546	1000	267	14.27	558	1000	300
20"	508.0	7.14	600	1000	205	12.70	604	1200	290	15.88	621	1200	322
22"	558.8	7.92	645	1000	220	14.27	655	1200	311	17.48	682	1200	348
24"	609.6	7.92	700	1000	240	15.88	706	1200	335	19.05	739	1200	371
26"	660.4	7.92	750	1000	250	15.88	760	1200	354	19.05	800	1200	391
28	711.2	8.14	810	1200	260	17.48	813	1300	376	19.05	857	1300	419
30"	762.0	8.74	850	1400	270	19.05	864	1300	398	19.05	912	1300	434

Dimensions in mm

JOINTS OVER 30" DIAMETER DIMENSIONS TO CUSTOMERS SPECIFICATION