


**KAMMPROFILE
GASKETS**








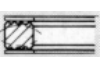

“High integrity seals for most demanding environments”

Characteristics

- Solid core with machined grooves and soft material facing (graphite, PTFE, others)
- Pass partition bars with the same profile.
- SS304L, SS316L, SS321 and other materials available.
- **Low seating stress, excellent tightness and extraordinary stability**
- **Ability to cope with fluctuating temperatures and pressures: heat exchanger's services**

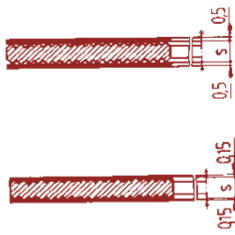
Kammprofile Gaskets, or Grooved Gaskets are suitable for the most difficult applications such as superheated steam, high pressure hydrocarbon or chemical service. These gaskets can be found from conventional Electric Power Plants as well as in the Nuclear Power Plants, chemical and petrochemical industries.

Gasket Profiles and limiting values

Profile	Cross-section	Materials/ Coating	K ₀	K ₁	R _z *
			[N/mm]	[mm]	(µm)
B7A		Graphite PTFE A.F. A1 Silver	15 b _D	1,0 b _D	25 to 50
B9A					
B15A			15 b _D	1,0 b _D	50 to 100
E7A					
B27A			50 b _D	1,0 b _D	25 to 50
B29A					
B25A			70 b _D	1,0 b _D	12,5 to 25
E27A					

* Recommended surface roughness of flange sealing surfaces

Characteristics and Details



In order to avoid damage to the flanges with the metal core of grooved gaskets, they are generally used with layers of graphite, PTFE, aluminium or silver, providing total protection to the flanges and a secure seal even at low minimum surface pressures.

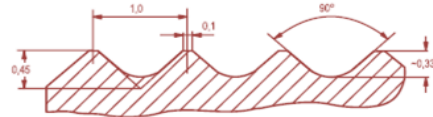
A triaxial stress is created in the profiling of the metallic carrier which has been filled with the layer material. The stability of this combination is therefore significantly higher than with a pure PTFE, graphite, or aluminium seal.

Grooved gaskets can be manufactured in wide range of sizes: from a few millimeters to a diameter of 3,600 mm. For gaskets in heat exchangers with pass partition bars, it is necessary to insert partitions with grooves of the same profile.

Kammprofile gaskets with standard profiling

In the standard profile, the peaks of the groove are on one level and the troughs are parallel to them. This profiling is designed in accordance with DIN EN 1514-6. The layer thickness should be 0.5 mm and for PTFE 0.35 mm.

This profiling should be used with gaskets for flange connections with male or female faces or tongue and groove flanges.



Surface Pressure

In order to avoid collapse, the sealing surface pressure must be between σ_{\min} and σ_{\max} :

Profile	Materials	Surface Pressure (N/mm ²)			
		T = 20°C		T = 300°C	
		σ_{\min}	σ_{\max}	σ_{\min}	σ_{\max}
B7A, B9A B15A E7A	Carbon Steel/Graphite Carbon Steel/PTFE	15	350	30 (1)	210 (1)
	1.4541/Graphite 1.4541/PTFE	15	500	30 (1)	420 (1)
	1.4541/Aluminium	80	500	95	420
	1.4541/silver	125	500	140	420
B27A B29A B25A E27A	Carbon Steel/Graphite Carbon Steel/PTFE	15	350	20 (1)	210 (1)
	1.4541/Graphite 1.4541/PTFE	15	500	20 (1)	420 (1)
	1.4541/Aluminium	70	500	80	420
	1.4541/silver	100	500	110	420

The PTFE - enveloped grooved gaskets

PTFE-enveloped gaskets consist of a stable gasket insert (flat, corrugated or grooved) and a PTFE envelope. Only high-quality PTFE is used for the envelope of these special gaskets, so as to protect the insert against chemical attack.







There are different options for the PTFE envelopes, which can be open onto the outer or inner diameter, or encase the entire insert. (depending on the customer requirements)

PTFE-enveloped gaskets are used in flange connections where there are high levels of chemical attack. Because of their outstanding sealing properties and high chemical resistance, this type of gaskets have demonstrated excellent performance at fluctuating pressures and temperatures ranging from -190 °C to +250 °C.

Also PTFE is physiologically harmless, and can be used in the food and pharmaceutical sectors.

Gasket Profiles and limiting values

PTFE-enveloped gasket with a grooved gasket insert of metal for even sealing surfaces, ceramic or glass is used for higher pressures:

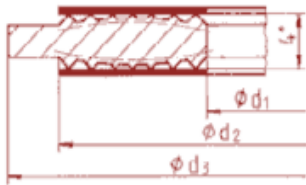
Profile	Cross-section	Materials	Surface Pressure (N/mm ²)		R _z * [mm]
			σ _{min}	σ _{max}	
PF7		PTFE 1.4541	15 (20°C) 17 (250°C)	500(20°C) 450(250°C)	25 to 50
PF9					
PF15					
PF27			15 (20°C) 17 (250°C)	500(20°C) 450(250°C)	
PF29					
PF25					

* Recommended surface roughness of flange sealing surfaces

Profile PF7, PF9 and PF15 with an even basic profile

Profile PF27, PF29 and PF25 with a convex basic profile

The “convex” Kammprofile Gasket



The convex grooved gaskets in Profile **B27A**, **B29A** and **B25A** have demonstrated improved sealing properties compared to standard grooved profiles. The improvement is achieved by the special convex form: decreasing depth of the groove troughs towards the midpoint of the profile.

The sealing layer made from soft material creates a thicker padding at the profile centre line than in the internal and external zones. The layer thickness for soft materials as a Graphite should be 0,5 mm and for PTFE 0,35 mm.

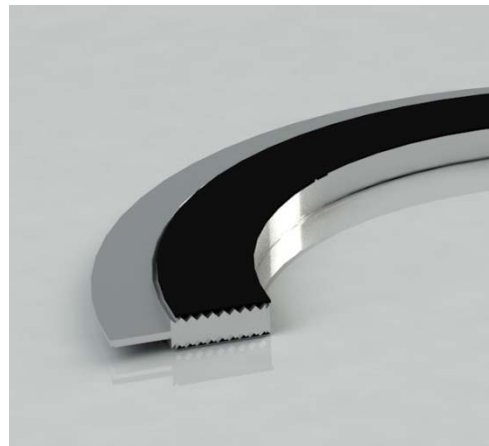
The specific surface pressure is greatest at the profile centre line, causing the sealing layers to flow well into the unavoidable irregularities and roughness on the flange surface.

Surface Pressure

The minimum surface pressure σ_v is determined by the layer material used with the convex grooved gasket. The highest permissible surface pressure at a temperature of v is σ_v and this determines the “allowable gasket load reaction”. The maximum allowable surface pressure σ_v is determined by the material used in the metal core.

σ_v [N/mm ²]	Possible Temperature in the Gasket Area (°C)							
	0	100	200	300	400	500	600	700
PTFE	15	16	-20					
Graphite	15	16	17	20	22	25		
Aluminium	70	70	75	80				
silver	100	100	105	110	115	120	125	125

σ_v [N/mm ²]	Possible Temperature in the Gasket Area (°C)							
	0	100	200	300	400	500	600	700
Copper	200	180	150	115				
20090								
Pure Iron 1.1003	350	310	260	210	170			
Steel St 35 1.0308	400	380	330	260	200			
Steel 15 Mo 1.5415	450	400	360	330	270	220		
Steel 13 Cr Mo 44 1.7335	450	450	420	390	330	280		
Stainless Steel 1.4541	500	480	450	420	390	350	280	
Stainless Steel 1.4828	600	600	570	540	500	460	240	160
Stainless Steel 1.4876	550	550	520	460	400	340	280	190


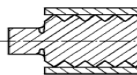
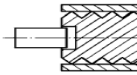



**KAMMPROFILE
GASKETS**
TECHNICAL DATA

Conforms to EN 1514-6 for DIN flanges

DN	Internal Diameter	External diameter			Centring Ring outside diameter										
		PN 010/40	PN 64/100	PN 250/400	PN 10	PN 16	PN 25	PN 40	PN 64	PN 100	PN 160	PN 250	PN 320	PN 400	
10	22	véase PN 64 a PN 160	véase PN 250 a PN 400	36	46	46	46	46	56	56	56	67	67	67	
15	26			42	51	51	51	51	61	61	61	61	72	72	–
20	31			47	61	61	61	61	–	–	–	–	–	–	–
25	36			52	71	71	71	71	82	82	82	82	83	92	104
32	46		62	66	82	82	82	82	–	–	–	–	–	–	
40	53		69	73	92	92	92	92	103	103	103	109	119	135	
50	65		81	87	107	107	107	107	113	119	119	124	134	150	
65	81		100	103	127	127	127	127	137	143	143	153	170	192	
80	95		115	121	142	142	142	142	148	154	154	170	190	207	
100	118		138	146	162	162	168	168	174	180	180	202	229	256	
125	142		162	178	192	192	194	194	210	217	217	242	274	301	
150	170		190	212	217	217	224	224	247	257	257	284	311	348	
175	195		215	245	247	247	254	265	277	287	284	316	358	402	
200	220		240	248	280	272	272	284	290	309	324	324	358	398	442
250	270		290	300	340	327	328	340	352	364	391	388	442	488	–
300	320	340	356	400	377	383	400	417	424	458	458	536	–	–	
350	375	395	415	–	437	443	457	474	486	512	–	–	–	–	
400	426	450	474	–	489	495	514	546	543	572	–	–	–	–	
450	480	506	–	–	539	555	–	571	–	–	–	–	–	–	
500	530	560	588	–	594	617	624	628	657	704	–	–	–	–	
600	630	664	700	–	695	734	731	747	764	813	–	–	–	–	
700	730	770	812	–	810	804	833	852	879	950	–	–	–	–	
800	830	876	886	–	917	911	942	974	988	–	–	–	–	–	
900	930	982	994	–	1 017	1 011	1 042	1 084	1 108	–	–	–	–	–	
1 000	1040	1 098	1 110	–	1 124	1 128	1 154	1 194	1 220	–	–	–	–	–	
1 200	1250	1 320	1 334	–	1 341	1 342	1 364	1 398	1 452	–	–	–	–	–	
1 400	1440	1 522	–	–	1 548	1 542	1 578	1 618	–	–	–	–	–	–	
1 600	1650	1 742	–	–	1 772	1 764	1 798	1 830	–	–	–	–	–	–	
1 800	1850	1 914	–	–	1 972	1 964	2 000	–	–	–	–	–	–	–	
2 000	2050	2 120	–	–	2 182	2 168	2 230	–	–	–	–	–	–	–	
2 200	2250	2 328	–	–	2 384	2 378	–	–	–	–	–	–	–	–	
2 400	2460	2 512	–	–	2 594	–	–	–	–	–	–	–	–	–	
2 600	2670	2 728	–	–	2 794	–	–	–	–	–	–	–	–	–	
2 800	2890	2 952	–	–	3 014	–	–	–	–	–	–	–	–	–	
3 000	3100	3 166	–	–	3 228	–	–	–	–	–	–	–	–	–	

Grooved Gasket Types with soft-material layers

Gasket Types	Cross-section	Gasket Types	Cross-section	Gasket Types	Cross-section
NR Type		IR Type With integrated Centring ring		LR Type With loose sheet Metal centring ring	



TECHNICAL DATA

Conforms to EN 1514-4 for DIN flanges

(PN 10 to PN 100)

d₁: Int. diameter (mm)

d₂: Ext. diameter (mm)


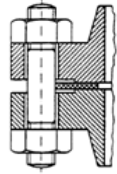

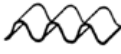
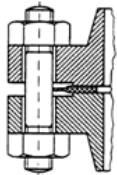


DN	d ₁	PN 10	d ₂				
			16	25	40	63	100
10	18	48	48	48	48	58	58
15	22	53	53	53	53	63	63
20	27	63	63	63	63	74	74
25	34	73	73	73	73	84	84
32	43	84	84	84	84	90	90
40	49	94	94	94	94	105	105
50	61	109	109	109	109	115	121
65	77	129	129	129	129	140	146
80	89	144	144	144	144	150	156
100	115	164	164	170	170	176	183
125	141	194	194	196	196	213	220
150	169	220	220	226	226	250	260
200	220	275	275	286	293	312	327
250	273	330	331	343	355	367	394
300	324	380	386	403	420	427	461
350	356	440	446	460	477	489	515
400	407	491	498	517	549	546	575
450	458	541	558	567	574	-	-
500	508	596	620	627	631	660	708
600	610	698	737	734	750	768	819
700	712	813	807	836	-	883	956
800	813	920	914	945	-	994	-
900	915	1020	1014	1045	-	1114	-

EN 1514-4

Flanges and their joints.
 Dimensions of gaskets for
 PN-designed flanges.

Part 4: Corrugated, flat or
grooved metallic and filled
 metallic gaskets for use with
 steel flanges

Gasket Types for this Standard

Gasket Types	Cross-section	Gasket Types	Cross-section
Type A Corrugated, filled		Self-centring Gasket	
Type A Corrugated Metal coating the filling			
Type B Corrugated metallic		Gasket with Centring Ring	
Type C Flat Metal coating the filling			
Type D Grooved Metal with or without supplemental sealing materials			
Type E Solid Flat Metal	