

METAL JACKETED GASKETS

04

Metal jacketed gaskets are proven sealing elements for use in apparatus construction, which are however increasingly being replaced at temperatures up to 550 °C by metal/soft-material gaskets, such as grooved gaskets (see remarks on the next page).

At temperatures above 500 °C, such as in hot-blast areas, metal jacketed gaskets can still hold their own against solid metal gaskets such as weld ring gaskets.

Jacketed gaskets generally consist of a metal sheet coating with an insert of RivaTherm Super, graphite or FA¹⁾ or some layers of sheet metal.

The metal sheet coating should be as soft and flexible as possible, but to prevent corrosion it is often made from a stainless steel jacket in 1.4541 or 1.4571 steel.

The harder the jacket, the finer the flange roughness needs to be.

The inlay is selected according to the flange irregularities that need to be covered. The better the quality and the evenness of the sealing surfaces, the harder the inlay can be.

There is a wide range of possible combinations; the following are extremes at both ends:

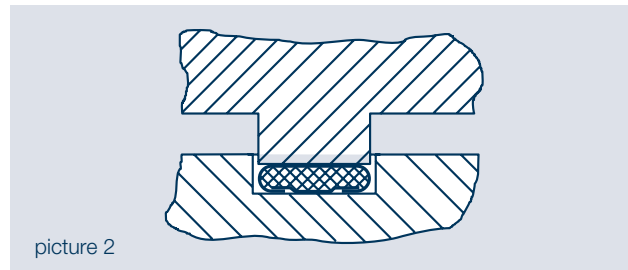
- very soft: Coating of aluminium,
inlay of graphite
- very hard: Coating of stainless steel,
inlay of mica



Metal jacketed gaskets for heat exchangers are supplied with partitions in the model shown (picture 1).

Metal jacketed gaskets are also available as frames with rounded corners.

In flanges with tongue and groove or male and female face joints the jacketed gaskets should be fitted so that the tongue and/or the male face is against the smooth side of the gasket (picture 2).



Gasket limiting values

Profiles			F2 to F17				Fw3	F3L
Materials			Aluminium Graphite	Copper Brass Graphite	Iron Nickel Graphite	Stainless steel Graphite	Iron Nickel Graphite	Iron Iron
Recommended max. roughness (R _z) of the flange surfaces	μm	from to	25 50	12,5 25	6,3 12,5	2,5 6,3	6,3 12,5	6,3 12,5
Surface pressure limits for 20 °C	N/mm ²	σ _v	30	60	70	100	60	200
		σ _θ	100	150	180	250	180	500
Surface pressure limits for 300 °C	N/mm ²	σ _v	(40)	70	80	115	70	200
		σ _θ	(60)	120	150	200	150	350

¹⁾ Fibre sheets with binder

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Jacketed gaskets Profile F3, F4, F8, FW3 and F17 are for flanges with raised face

Due to its dimensions, Profile F17 produces lower bolt loads and more favourable deformation behaviour than Profiles F3, F4, F8 and FW3.

Jacketed gaskets Profile F8 and F10 are mostly used in apparatus construction.

Materials for the coating

1.0333; 1.4541; 1.4571; 1.4828; 3.0255; 2.0090; 2.0321; 2.4066; 2.4360, other materials available on request.

Materials for the insert

RivaTherm Super, graphite, Fa¹⁾

¹⁾ Fibre sheets with binder

Gasket profiles

Profile	Cross-section
F2	
F3	
F4	
F8	
F10	
F12	
F17	
FW3	

Remarks

Particularly in apparatus and equipment engineering, there are situations where extraordinary stability is required of the gasket. This is the case for example when the shell pressure test is carried out in a floating-head heat exchanger while the pipe bundle is drained. In addition to the pre-tensioning force on the (sometimes notably large) floating head surface is added an additional pressure force from the test pressure of the shell. This will lead to overload and subsequent destruction of the gasket if it does not have the required stability.

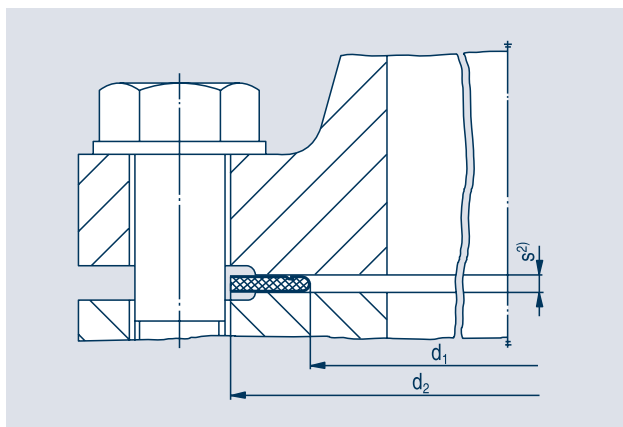
Experience shows that the stability of metal jacketed gaskets is in many cases insufficient to solve this problem. Due to their particular design, a stress condition can be created in the sheet metal coating of metal jacketed gaskets with inlays from soft-materials which destroys the gasket, particularly if the flange sealing surfaces have been coated with sealing compounds or grease to make them easier to fit.

We recommend dry installation and the use of stable gaskets.

Particularly suitable are grooved gaskets with layers of graphite or PTFE. These can also be supplied with the appropriate pass partitions, so that the switch from metal jacketed gaskets can be made without any problem.

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Ordering example for a jacketed gasket, Profile F4,
DN 100, PN 16, works standard 107, made of ...¹⁾:

**Jacketed gasket F4, DN 100, PN 16, works standard 107-1,
copper/FS**

Works standard 107-1 for flanges in accordance with DIN and BS4504, Profile F3, F4, F8 and FW3

DN	PN 10		PN 16		PN 25		PN 40		PN 64		PN 100	
	d ₁	d ₂	d ₁	d ₂	d ₁	d ₂	d ₁	d ₂	d ₁	d ₂	d ₁	d ₂
10	25	46	25	46	25	46	25	46	30	56	30	56
15	30	51	30	51	30	51	30	51	35	61	35	61
20	40	61	40	61	40	61	40	61	-	-	-	-
25	50	71	50	71	50	71	50	71	55	82	55	82
32	60	82	60	82	60	82	60	82	-	-	-	-
40	70	92	70	92	70	92	70	92	75	103	75	103
50	85	107	85	107	85	107	85	107	85	113	85	119
65	105	127	105	127	105	127	105	127	105	138	105	144
80	120	142	120	142	120	142	120	142	120	148	120	154
100	140	162	140	162	145	168	145	168	140	174	137	180
125	170	192	170	192	170	194	170	194	165	210	160	217
150	195	218	195	218	200	224	200	224	195	247	190	257
175	225	248	225	248	230	254	240	265	235	277	230	287
200	250	273	250	273	260	284	260	290	255	309	250	324
250	300	328	300	329	315	340	320	352	315	364	310	391
300	350	378	355	384	370	400	380	417	375	424	370	458
350	410	438	415	444	425	457	435	474	430	486	425	512
400	460	489	460	495	475	514	505	546	500	543	495	572
500	565	594	580	617	580	624	580	628	575	657	570	704
600	660	695	695	734	695	731	695	747	690	764	685	813
700	780	810	765	804	785	833	800	852	795	879	790	950
800	880	917	870	911	890	942	910	974	905	988	-	-
900	980	1017	970	1011	990	1042	1020	1084	1010	1108	-	-
1000	1080	1124	1085	1128	1100	1154	1130	1194	1120	1220	-	-
1200	1300	1341	1295	1342	1300	1364	1325	1398	1320	1425	-	-
1400	1500	1548	1495	1542	1510	1578	1545	1618	-	-	-	-
1600	1720	1772	1715	1764	1730	1798	1755	1830	-	-	-	-
1800	1920	1972	1910	1964	1930	2000	-	-	-	-	-	-
2000	2120	2182	2105	2168	2150	2230	-	-	-	-	-	-
2200	2320	2384	2310	2378	-	-	-	-	-	-	-	-
2400	2520	2594	-	-	-	-	-	-	-	-	-	-
2600	2730	2794	-	-	-	-	-	-	-	-	-	-
2800	2950	3014	-	-	-	-	-	-	-	-	-	-
3000	3150	3228	-	-	-	-	-	-	-	-	-	-

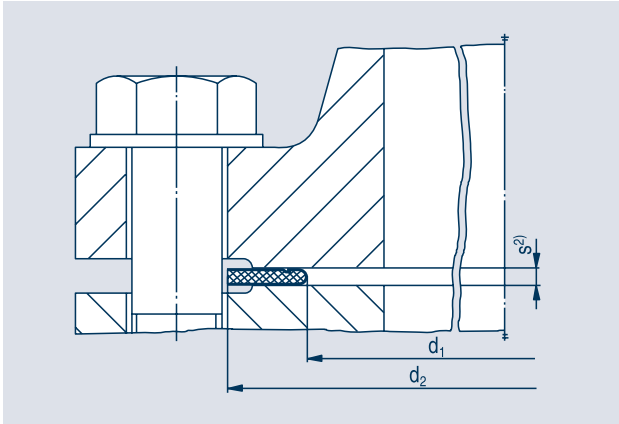
- Flanges compliant with the standard not available

Dimensions in mm

¹⁾ Specify material when placing order

²⁾ standard thickness of 3 mm, other thicknesses on request

METAL JACKETED GASKETS



Ordering example for a jacketed gasket, Profile F4, NPS 5, Class 600, conforms to EN 12560-7, made of ...¹⁾:

Jacketed gasket F4, NPS 5, Class 600, EN 12560-4, copper/ FA

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Conforms to EN 12560-7 for flanges in accordance with ANSI B 16.5

NPS	d ₁	d ₂	Class		d ₃			
	150 - 300	660 - 2500	150	300	600	900	1500	2500
½	22	22	47,6	54,0	54,0	63,5	63,5	69,9
¾	29	29	57,2	66,7	66,7	69,9	69,9	76,2
1	38	38	66,7	73,0	73,0	79,4	79,4	85,7
1¼	48	48	76,2	82,6	82,6	88,9	88,9	104,8
1½	57	54	85,7	95,3	95,3	98,4	98,4	117,5
2	75	73	104,8	111,1	111,1	142,9	142,9	146,1
2½	90	86	123,8	130,2	130,2	165,1	165,1	168,3
3	113	108	136,5	149,2	149,2	168,3	174,6	196,9
4	141	132	174,6	181,0	193,7	206,4	209,6	235,0
5	165	152	196,9	215,9	241,3	247,7	254,0	279,4
6	196	190	222,3	250,8	266,7	288,9	282,6	317,5
8	253	238	279,4	308,0	320,7	358,8	352,4	387,4
10	294	286	339,7	362,0	400,1	435,0	435,0	476,3
12	356	343	409,6	422,3	457,2	498,5	520,7	549,2
14	382	375	450,9	485,8	492,1	520,7	577,9	-
16	434	425	514,4	539,8	565,2	574,7	641,4	-
18	500	489	549,3	596,9	612,8	638,2	704,9	-
20	540	533	606,4	654,1	682,6	698,5	755,7	-
24	647	641	717,6	774,7	790,6	838,2	901,7	-

- Flanges compliant with the standard not available

Dimensions in mm

¹⁾ Specify material when placing order

²⁾ standard thickness of 3 mm, other thicknesses on request

METAL JACKETED GASKETS

Works standard 107-2 for flanges in accordance with ANSI/ASME B 16.5, Profile F3, F4, F8, FW3

NPS	d ₁	Class		d ₂					
		150	300	400	600	900	1500	2500	
½	25	47	53	53	53	63	63	69	
¾	33	57	66	66	66	69	69	76	
1	38	66	73	73	73	79	79	85	
1¼	47	76	82	82	82	88	88	104	
1½	54	85	95	95	95	98	98	117	
2	73	104	111	111	111	142	142	146	
2½	86	123	130	130	130	165	165	168	
3	108	136	149	149	149	168	174	196	
3½	120	161	165	161	161	-	-	-	
4	132	174	180	177	193	206	209	234	
5	160	196	215	212	241	247	254	279	
6	190	222	250	247	266	288	282	317	
8	238	279	307	304	320	358	352	387	
10	286	339	361	358	400	434	434	476	
12	343	409	422	419	457	498	520	549	
14	374	450	485	482	492	520	577	-	
16	425	514	539	536	565	574	641	-	
18	489	549	596	593	612	638	704	-	
20	533	606	654	647	682	698	755	-	
22	587	660	704	701	733	-	-	-	
24	641	717	774	768	790	838	901	-	

For dimensions below the stepped line, we recommend Profile F17 rather than FW3 for manufacturing reasons.

Dimensions in mm

Works standard 107-3 for flanges in accordance with ANSI/ASME B 16.5, Profile F17

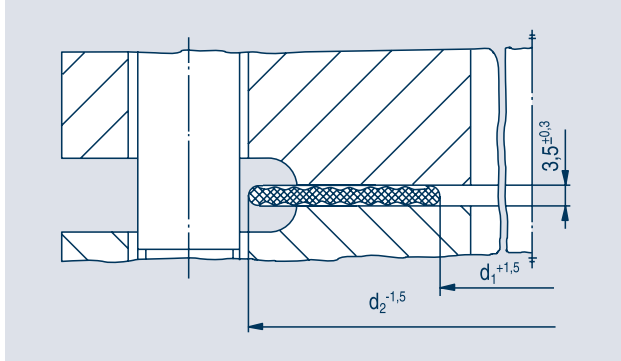
NPS	d ₁	d ₂	Class		d ₃					
			150	300	400	600	900	1500	2500	
½	21	31	47	53	53	53	63	63	69	
¾	27	37	57	66	66	66	69	69	76	
1	33	46	66	73	73	73	79	79	85	
1¼	42	58	76	82	82	82	88	88	104	
1½	48	68	85	95	95	95	98	98	117	
2	60	80	104	111	111	111	142	142	146	
2½	73	92	123	130	130	130	165	165	168	
3	89	108	136	149	149	149	168	174	196	
3½	102	121	161	165	161	161	-	-	-	
4	114	140	174	180	177	193	206	209	234	
5	141	167	196	215	212	241	247	254	279	
6	168	194	222	250	247	266	288	282	317	
8	219	251	279	307	304	320	358	352	387	
10	273	311	339	361	358	400	434	434	476	
12	324	362	409	422	419	457	498	520	549	
14	356	394	450	485	482	492	520	577	-	
16	406	451	514	539	536	565	574	641	-	
18	457	502	549	596	593	612	638	704	-	
20	508	559	606	654	647	682	698	755	-	
22	559	610	660	704	701	733	-	-	-	
24	610	660	717	774	768	790	838	901	-	

- Flanges compliant with the standard not available

Dimensions in mm

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Profile FW3



Ordering example for a double-corrugated gasket, Profile FW3, NPS 3, Class 600, in accordance with ASME B16.20 for flanges in accordance with ASME/ANSI B 16.5, made of ...¹⁾:

Double-corrugated gasket, Profile FW3, NPS 3, Class 600, ASME B16.20 for flanges in accordance with ASME/ANSI B16.5, steel/FA

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In accordance with ASME B16.20 for flanges in accordance with ASME/ANSI B16.5

NPS	d ₁	class 150	class 300	class 400	d ₂ class 600	class 900	class 1500	class 2500
½	22,4	44,5	50,8	50,8	50,8	60,5	60,5	66,8
¾	28,7	54,1	63,5	63,5	63,5	66,8	66,8	73,2
1	38,1	63,5	69,9	69,9	69,9	76,2	76,2	82,6
1¼	47,8	73,2	79,5	79,5	79,5	85,9	85,9	101,6
1½	54,1	82,6	92,2	92,2	92,2	95,3	95,3	114,3
2	73,2	101,6	108,0	108,0	108,0	139,7	139,7	143,0
2½	85,9	120,7	120,7	127,0	127,0	162,1	162,1	165,1
3	108,0	133,4	146,1	146,1	146,1	165,1	171,5	193,8
4	131,8	171,5	177,8	174,8	190,5	203,2	206,5	231,9
5	152,4	193,8	212,9	209,6	238,3	244,6	251,0	276,4
6	190,5	219,2	247,7	244,6	263,7	285,8	279,4	314,5
8	238,3	276,4	304,8	301,8	317,5	355,6	349,3	384,3
10	285,8	336,6	358,9	355,6	397,0	431,8	431,8	473,2
12	342,9	406,4	419,1	416,1	454,2	495,3	517,7	546,1
14	374,7	447,8	482,6	479,6	489,0	517,7	574,8	-
16	425,5	511,3	536,7	533,4	562,1	571,5	638,3	-
18	489,0	546,1	593,9	590,6	609,6	635,0	701,8	-
20	533,5	603,3	651,0	644,7	679,5	695,5	752,6	-
24	641,4	714,5	771,7	765,3	787,4	835,2	898,7	-

Dimensions in mm

In accordance with ASME B16.20 for flanges in accordance with ASME B16.47 Series B

NPS	d ₁	class 150	class 300	d ₂ class 400	class 600	class 900
26	673,1	722,4	768,4	743,0	762,0	835,1
28	723,9	773,2	822,5	797,1	816,1	898,7
30	774,7	824,0	882,7	854,2	876,3	955,8
32	825,5	877,8	936,8	908,1	930,4	1013,0
34	876,3	931,9	990,6	958,9	993,9	1070,1
36	927,1	984,3	1044,7	1019,3	1044,7	1120,9
38	977,9	1041,4	1095,4	1070,1	1101,9	1197,1
40	1028,7	1092,2	1146,3	1124,0	1152,7	1247,9
42	1079,5	1143,0	1197,1	1174,8	1216,2	1298,7
44	1130,3	1193,8	1247,9	1228,9	1267,0	1365,5
46	1181,1	1252,5	1314,5	1286,0	1324,1	1432,1
48	1231,9	1303,3	1365,3	1343,2	1387,6	1482,9
50	1282,7	1354,1	1416,1	1400,3	1444,8	-
52	1333,5	1404,9	1466,9	1451,1	1495,6	-
54	1384,3	1460,5	1527,3	1514,6	1552,7	-
56	1435,1	1511,1	1590,8	1565,4	1603,5	-
58	1485,9	1576,3	1652,5	1616,2	1660,7	-
60	1536,7	1627,1	1703,3	1679,7	1730,5	-

- Flanges compliant with the standard not available

Dimensions in mm

¹⁾ Specify material when placing order

Ordering example for a double-corrugated gasket, Profile FW3, NPS 30, Class 150, in accordance with ASME B16.20 for flanges in accordance with ASME 16.47 Series B, made of ...¹⁾:

Double-corrugated gasket FW3, NPS 30, Class 150, ASME B16.20 for flanges in accordance with ASME B16.47 Series B, Steel/FA

METAL JACKETED GASKETS

In accordance with ASME B16.20 for flanges in accordance with ASME B16.47 Series A

NPS	d ₁	class 150	class 300	d ₂ class 400	class 600	class 900
26	673,1	771,7	831,9	828,8	863,6	879,6
28	723,9	828,8	895,4	889,0	911,4	943,1
30	774,7	879,6	949,5	943,1	968,5	1006,6
32	825,5	936,8	1003,3	1000,3	1019,3	1070,1
34	876,3	987,6	1054,1	1051,1	1070,1	1133,6
36	927,1	1044,7	1114,6	1114,6	1127,3	1197,1
38	977,9	1108,2	1051,1	1070,1	1101,9	1197,1
40	1028,7	1159,0	1111,3	1124,0	1152,7	1247,9
42	1079,5	1216,2	1162,1	1174,8	1216,2	1298,7
44	1130,3	1273,3	1216,2	1228,9	1267,0	1365,5
46	1181,1	1324,1	1270,0	1286,0	1324,1	1432,1
48	1231,9	1381,3	1320,8	1343,2	1387,6	1482,9
50	1282,7	1432,1	1374,9	1400,3	1444,8	-
52	1333,5	1489,2	1425,7	1451,1	1495,6	-
54	1384,3	1546,4	1489,2	1514,6	1552,7	-
56	1435,1	1603,5	1540,0	1565,4	1603,5	-
58	1485,9	1660,7	1590,8	1616,2	1660,7	-
60	1536,7	1711,5	1641,6	1679,7	1730,5	-

- Flanges compliant with the standard not available

Dimensions in mm

Ordering example for a double-corrugated gasket, Profile FW3, NPS 30, Class 300, in accordance with ASME B16.20 for flanges in accordance with ASME B 16.47 Series A, made of ...¹⁾:

Double-corrugated gasket, Profile FW3, NPS 30, Class 300, ASME B16.20 for flanges in accordance with ASME B16.47, Series A, steel/FS

For flanges with tongue and groove*

Conforms to En1514

(PN 10 to PN 160)

Ordering example for a jacketed gasket, Profile F8, DN 100, made of ...¹⁾:

Jacketed gasket F8, DN 100, PN 2691, copper/FA

For flanges with male and female*

Conforms to En1514

(PN 10 to PN 100)

Ordering example for a jacketed gasket, Profile F8, DN 100, made of ...¹⁾:

Jacketed gasket F8, DN 100, PN 2692, copper/FA

In accordance with ANSI for flanges in accordance with ASME/ANSI B16.5

(Class 150 to Class 1500)

Ordering example for a jacketed gasket, Profile F8, NPS 5, wide model, made of ...¹⁾:

Jacketed gasket, F8, NPS 5, ASME/ANSI B16.5 wide, tongue and groove, copper/FA

In accordance with ANSI B for flanges in accordance with ASME/ANSI B16.5

(Class 150 to Class 1500)

Ordering example for a jacketed gasket, Profile F8, NPS 5, wide model, made of ...¹⁾:

Jacketed gasket, F8, NPS 5, ASME/ANSI B16.5 wide, male and female, copper/FA

Warning:

At gasket margin widths below 10 mm use Profile F10 and/or F12, above 10 mm use Profile F8.

Gasket thickness: to DN 80 resp. NPS 3½ = 2,5 mm
above DN 80 resp. NPS 3½ = 3,0 mm

* See section 3 "Flat gaskets for DIN, ASME/ANSI, BS"

¹⁾ Specify material when placing order