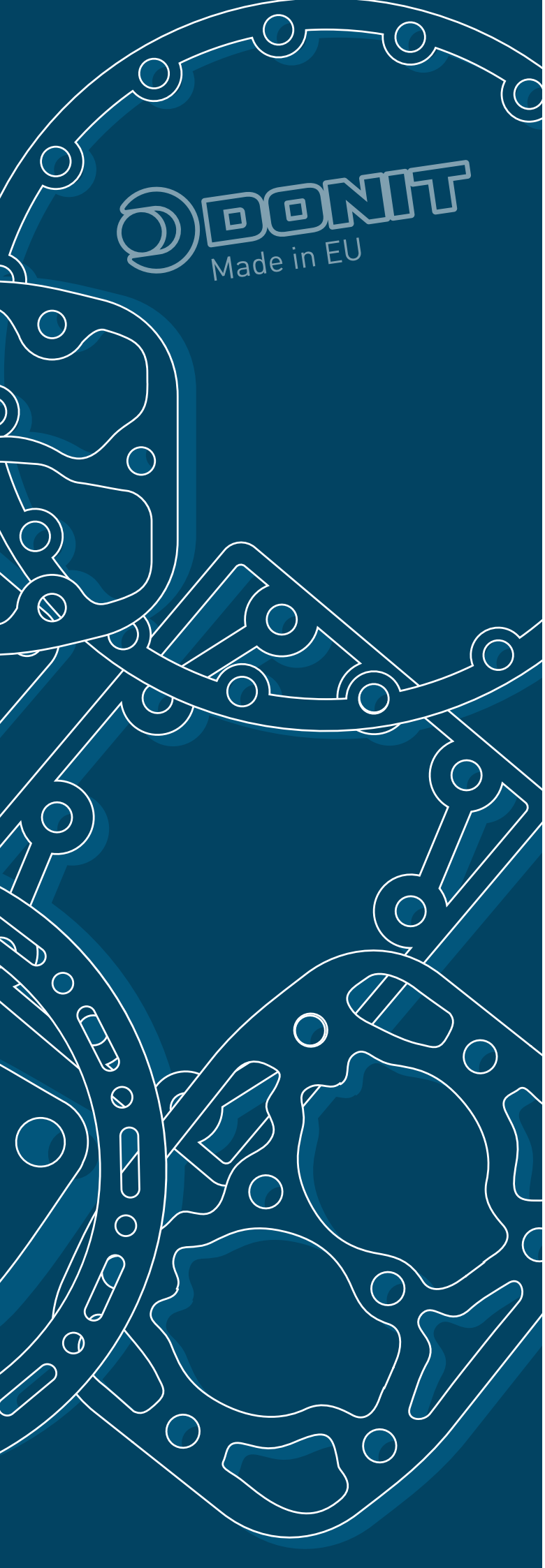


DONIT®
A perfect fit

DONIT INDUSTRIAL SEALING SOLUTIONS

DONIT® Sealing technologies

As a leader in gaskets, gasket sheets, and advanced sealing technologies, we offer the optimum solution with a perfect fit for your most challenging sealing requirements. Backed by decades of excellence in understanding of sealing problems, extensive know-how in application engineering, and consistent manufacturing of reliable high quality products, we are in position to respond quickly and efficiently to your inquiry.

WE ARE A TRUE PARTNER FOR YOUR SUCCESS

With a wide experience in problem-solving and unshaken commitment to high quality standards, we are dedicated to provide you the best service and products. In addition, through customer-driven innovation, our strong R&D team is qualified to successfully design the adequate sealing solution.
Our customer satisfaction rests upon four pillars:

- Complete production chain and international sales network
- Quality assurance and safety
- Application engineering
- Technical training courses and seminars

THE DONIT® PHILOSOPHY

Our philosophy is based on building long-term business relationship with our customers that extends across many sectors of industries. Customer satisfaction is our driving-force which is attained through the constant supply of reliable and high quality products embracing product improvement and support.
DONIT® gasket sheets and sealing solutions are high quality products which have received several industrial quality approvals. Our products support the environmental legislation without compromising their sealing performance.

EMPLOYEES

Over 200 employees dedicated to you:
We strive for permanent professional and personal growth. We promote teamwork and diversity.

Our international team supports you regardless of your geographical location.

80% - Secondary school / technical school or lower

18% - Bachelor or equivalent

2% - Doctoral or equivalent

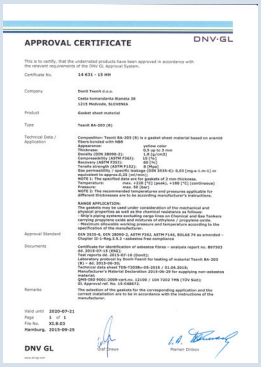
CERTIFIED QUALITY

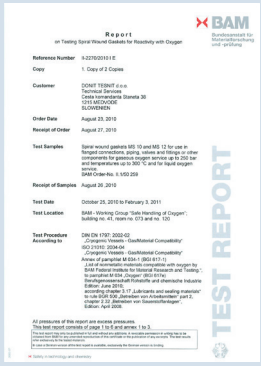
We assure high quality, environmentally friendly products to our customers. Quality and care for the environment is embedded in both our minds and our organization.
Care for the environment is embedded in our tradition.
DONIT TESNIT d.o.o. is certified by international ISO 9001 and ISO 14001 standards.

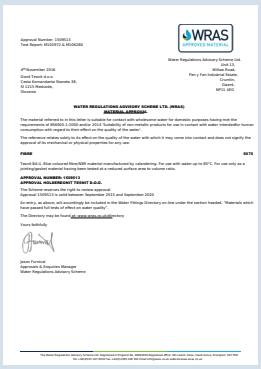
We also ensure that product quality and safety are in accordance with a number of widely recognized international standards such as:
DVGW (DIN 3535-6, VP 401), SVGW (DIN 3535-6), ELL, DVGW W270, BAM, WRAS, TA-Luft (VDI 2440), API 6FA / API 607, ISO 10497, ABS, DNV GL


DVGW CERT
DIN-DVGW type examination certificate
DIN-DVGW-Baumusterprüfzertifikat
NG-5123BL0583

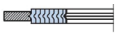
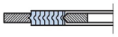
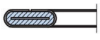
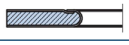
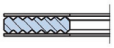
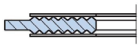
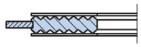
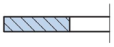
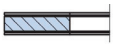
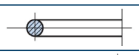
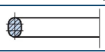
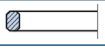
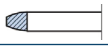
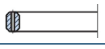
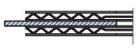
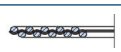
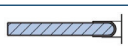

amtec
CERTIFICATE


APPROVAL CERTIFICATE
DNV·GL


BAM
Report
TEST REPORT


WRAS
APPROVED MATERIAL


ABS
Certificate of
MANUFACTURING ASSESSMENT

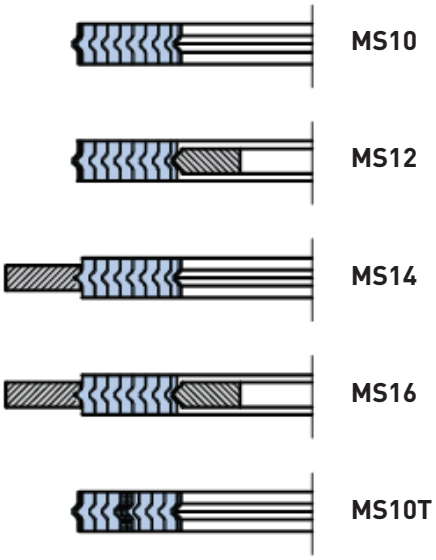
TYPE	SECTION	APPLICATION	MAX DIAMETER (mm)	MAX THICKNESS (mm)	MAX OPERATING PRESSURE (bar)	MAX OPERATING TEMPEARURE (°C)	PG. NR.
MS10		valve bonets, stoppers for boilers	2200	2.5 ÷ 7.2	400	550	4
MS12		for high pressures, turbolences	2200	3.2 ÷ 7.2	400	550	4
MS14		for high pressures	2200	3.2 ÷ 7.2	400	550	4
MS16		for high pressures, turbolences	2200	3.2 ÷ 7.2	400	550	4
MS10T		gasket with sealing zone of PTFE	2200	3.2 ÷ 4.5	400	250	4
C		flange male-female	200	1.5 ÷ 5	100	550	10
MP10		heat exchangers, steam and fluid seal	4000	2 ÷ 10	100	550	10
MP10A		heat exchangers, steam and fluid seal	4000	3 ÷ 5	100	550	10
MP12		big flanges, not ideal flat	4000	2 ÷ 10	100	550	10
MP14		heat exchangers, steam and fluid seal	4000	2 ÷ 10	100	550	10
MP16		gas and vapor seals	4000	2 ÷ 5	100	550	10
MP18		gas and vapor seals	4000	2 ÷ 5	100	550	10
MP19		valve covers and vacuum seals	4000	2 ÷ 4	100	550	10
MP22		steam (vapor) and fluid seals	2000	2 ÷ 5	100	700	10
M7A		power plants, manhole, heat exchangers	3000	2.5 ÷ 6	400	700	16
M7B		power plants, manhole, heat exchangers	3000	2.5 ÷ 7	400	700	16
M7C		power plants, manhole, heat exchangers	3000	2.5 ÷ 8	400	700	16
M7E		power plants, manhole, heat exchangers	3000	2.5 ÷ 9	400	700	16
M10		power plants, manhole, heat exchangers	3000	0.2 ÷ 3	400	550	16
M10A		power plants, manhole, heat exchangers	3000	2 ÷ 6	400	550	16
M14		air and gas compressor	1000	30	160	500	20
M15-R		high temperature and pressure	1000	11.18 ÷ 44.45	700	1000	20
M16-R		high temperature and pressure	1000	9.65 ÷ 41.4	700	1000	20
M17-L		check valves, high temperature	1000	8 ÷ 50	320	600	20
M18-RX		high temperature and pressure	600	19.05 ÷ 25.4	700	1000	20
M19-BX		high temperature and pressure	850	9.30 ÷ 39.84	1500	1000	20
MW12		low pressure applications, space limitation	2000	1.2 ÷ 1.5	50	550	23
MW12A		low pressure applications, higher temperatures, gas ducts	2000	3 ÷ 5	50	550	23
MW12AE		low pressure applications, higher temperatures, gas ducts	2000	4 ÷ 5	50	550	23
MW13A		low pressure applications, higher temperatures, gas ducts	2000	4 ÷ 5	50	550	23
MW13AE		low pressure applications, higher temperatures, gas ducts	2000	4 ÷ 5	50	550	23
MW22A		flanges with large diameters, process industry	4000	8 ÷ 12	50	550	23
MW23A		flanges with large diameters, process industry	4000	8 ÷ 12	50	550	23
MW12C		flanges with large diameters, process industry	2000	5 ÷ 8	50	550	23
BA10		all common applications	1500	1.5 ÷ 3	100	250	26
MP1		good resistance to erosion	1500	1.5 ÷ 3	150	450	33
MP1		good resistance to erosion	1500	1.5 ÷ 3	250	450	33
TF02÷TF040		high chemical stability, good resistance to aggresive chemicals	800	2 ÷ 10	50	250	35

Temperature and pressure represent maximum values and should not be used simultaneously. They are given only as guidance, since they depend not only on the type of gasket material but also on the assembly conditions. Very important factors are nature of service medium, type of flange, surface pressure and others. Given values are recommended for typical flange gaskets constructions. Max. parameters can be changed by using special materials.

SPIRAL WOUND GASKETS

PROPERTIES AND APPLICATIONS

Spiral wound gaskets are special semi-metallic gaskets of great resilience, therefore they are very suitable for applications featuring heavy operating conditions. Spiral wound gaskets are manufactured by spirally winding a V-shaped metal strip and a strip of non-metallic filler material. The metal strip holds the filler, providing the gasket with mechanical resistance and resilience. Spiral wound gaskets can be reinforced by an outer centering ring and/or inner retaining ring. The outer centering ring controls the compression and holds the gasket centrally within the bolt circle. The inner retaining ring increases the axial rigidity and resilience of the gasket. Spiral wound gaskets should always be in contact with the flange and should not protrude into the pipe or project from the flange. They can be used for sealing flange joints, manhole and handhold covers, tube covers, boilers, heat exchangers, pressure vessels, pumps, compressors and valves; in industries such as petrochemical, pharmaceutical, shipbuilding, and food processing, in power industries and nuclear power stations. They are ideal for sealing steam, oil, liquids, gases, acids, alkalines, various organic media and solvents.



ADVANTAGES

Sealing under heavy operating conditions. Strong stress compensation, stable and reliable sealing performance even under frequent pressure fluctuation conditions. Solid construction provides stability and sealability even when the sealing surfaces are slightly corroded or bent. Easy installation.

SHAPE AND CONSTRUCTION

Spiral wound gaskets are produced in several types and combination of materials to fit the most stringent application. Spiral wound gaskets are usually of circular shape, however we can produce them in other shapes such as: oval, rectangular, with round corners, etc. Our standard production program comprises a range of spiral wound gaskets with inner diameters of 10 mm to 3000 mm and a nominal thickness of 3.2 mm, 4.5 mm and 6.5 mm. Spiral wound gaskets of non-standard dimensions and shapes, and larger diameters are available on request.

GASKET STANDARD TYPES

Gaskets without centering and inner ring (Type MS10)
Gaskets without centering and inner ring (Type MS10T)*
Gaskets with inner ring (Type MS12)
Gaskets with centering (outer) ring (Type MS14)
Gaskets with centering and with inner ring (Type MS16)

*With PTFE sealing zone

Metallic strip

Standard thickness of the metallic strip is 0.2 mm.

MATERIALS FOR METALLIC STRIP	
ASTM	**EN Material No.**
AISI 304	1.4301
AISI 309	1.4828
AISI 316, AISI 316L	1.4401, 1.4404
AISI 316Ti	1.4571
AISI 321	1.4541
Monel (NiCu30Fe)	2.4360

Other alloys available on request.

Filler

- Filler is normally used for thicknesses from 0.5 mm to 0.6 mm.
- Flexible graphite 98%
- Flexible graphite 99.85%
- PTFE, E-PTFE
- Mica

Centering ring

The centering ring does not come into direct contact with contained fluid. It is normally made of carbon steel and electroplated or painted to avoid corrosion. Other materials are available on request.

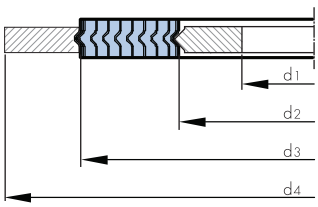
Inner ring

The inner ring is used to avoid excessive compression due to high seating stress in high-pressure service and it is also used to reduce turbulence in the flange area. It is normally made of the same material as the gasket metallic strip.

DIMENSIONS

Limitations for manufacturing of dimensions are general and can vary according to the special customer requirements.

LIMITATIONS FOR MANUFACTURING DIMENSIONS			
Thicknesss [mm]	**Max diameter d_3 (mm)**	**Maximum width - b_g (mm)**	
		Graphite	**PTFE**
2.5	300	16	13
3.2	700	22	19
4.5	1500	30	24
6.5	2300	35	24
7.2	2300	30	24



Thickness

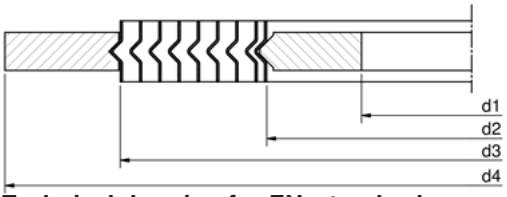
The standard manufacturing thicknesses for spiral wound gaskets are: 3.2 mm, 4.5 mm and 6.5 mm (measured across metallic strip not including the filler, which protrudes 0.2-0.3 mm beyond the metal).

Manufacturing tolerances

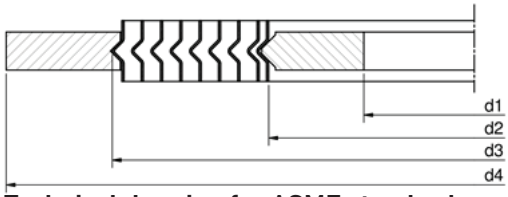
The tolerance of the gasket diameters (d1, d2, d3, d4, s, s1, s2) are stipulated by ASME B16.20 and EN 1514-2 standards. The gaskets designed for non-standard flanges meet the recommendations by the ASME B16.20.

Dimensions

The dimensions of the standard SWG meet the ASME, BS, DIN and EN standards.



Technical drawing for EN standards



Technical drawing for ASME standards

EN 1514-2:2005 Spiral wound gaskets for EN 1092-1 flanges

DN (mm)	d1 (mm)	d2 (mm)	d3 (mm)		d4 (mm)						
PN Class	PN 10-400	PN 10-400	PN 10-40	PN 64-400	PN 10	PN 16	PN 25	PN 40	PN64	PN 100	PN 160
10	18	24	34	34	46	46	46	46	56	56	56
15	23	29	39	39	51	51	51	51	61	61	61
20	28	34	46	—	61	61	61	61	—	—	—
25	35	41	53	53	71	71	71	71	82	82	82
32	43	49	61	—	82	82	82	82	—	—	—
40	50	56	68	68	92	92	92	92	103	103	103
50	61	70	86	86	107	107	107	107	113	119	119
65	77	86	102	106	127	127	127	127	137	143	143
80	90	99	115	119	142	142	142	142	148	154	154
100	115	127	143	147	162	162	168	168	174	180	180
125	140	152	172	176	192	192	194	194	210	217	217
150	167	179	199	203	218	218	224	224	247	257	257
200	216	228	248	252	273	273	284	290	309	324	324
250	267	279	303	307	327	329	340	352	364	391	388
300	318	330	354	358	377	384	400	417	424	458	458
350	360	376	400	404	437	444	457	474	486	512	—
400	410	422	450	456	488	495	514	546	543	572	—
500	510	522	550	556	593	617	624	628	657	704	—
600	610	622	650	656	695	734	731	747	764	813	—
700	710	722	756	762	810	804	833	852	879	950	—
800	810	830	864	870	917	911	942	974	988	—	—
900	910	930	964	970	1017	1011	1042	1084	1108	—	—
1000	1010	1030	1074	1080	1124	1128	1154	1194	—	—	—

ASME B16.20:2012 Spiral wound gaskets for ASME B16.5 flanges

NPS (in)	d1 (mm)					d2 (mm)					d3 (mm)		d4 (mm)						
Class (lb)	150-300	400-600	900	1500	2500	150-300	400-600	900	1500	2500	150-600	900-2500	150	300	400	600	900	1500	2500
1/2	14.2	14.2	-	14.2	14.2	19.1	19.1	-	19.1	19.1	31.8	31.8	47.8	54.1	-	54.1	-	63.5	69.9
3/4	20.6	20.6	-	20.6	20.6	25.4	25.4	-	25.4	25.4	39.6	39.6	57.2	66.8	-	66.8	-	69.9	76.2
1	26.9	26.9	-	26.9	26.9	31.8	31.8	-	31.8	31.8	47.8	47.8	66.8	73.2	-	73.2	-	79.5	85.9
11/4	38.1	38.1	-	33.3	33.3	47.8	47.8	-	39.6	39.6	60.5	60.5	76.2	82.6	-	82.6	-	88.9	104.9
11/2	44.5	44.5	-	41.4	41.4	54.1	54.1	-	47.8	47.8	69.9	69.9	85.9	95.3	-	95.3	-	98.6	117.6
2	55.6	55.6	-	52.3	52.3	69.9	69.9	-	58.7	58.7	85.9	85.9	104.9	111.3	-	111.3	-	143.0	146.1
21/2	66.5	66.5	-	63.5	63.5	82.6	82.6	-	69.9	69.9	98.6	98.6	124.0	130.3	-	130.3	-	165.1	168.4
3	81.0	81.0	78.7	78.7	78.7	101.6	101.6	95.3	92.2	92.2	120.7	120.7	136.7	149.4	-	149.4	168.4	174.8	196.9
4	106.4	102.6	102.6	97.8	97.8	127.0	120.7	120.7	117.6	117.6	149.4	149.4	174.8	181.1	177.8	193.8	206.5	209.6	235.0
5	131.8	128.3	128.3	124.5	124.5	155.7	147.6	147.6	143.0	143.0	177.8	177.8	196.9	215.9	212.9	241.3	247.7	254.0	279.4
6	157.2	154.9	154.9	147.3	147.3	182.6	174.8	174.8	171.5	171.5	209.6	209.6	222.3	251.0	247.7	266.7	289.1	282.7	317.5
8	215.9	205.7	196.9	196.9	196.9	233.4	225.6	222.3	215.9	215.9	263.7	257.3	279.4	308.1	304.8	320.8	358.9	352.6	387.4
10	268.2	255.3	246.1	246.1	246.1	287.3	274.6	276.4	266.7	270.0	317.5	311.2	339.9	362.0	358.9	400.1	435.1	435.1	476.3
12	317.5	307.3	292.1	292.1	292.1	339.9	327.2	323.9	323.9	317.5	374.7	368.3	409.7	422.4	419.1	457.2	498.6	520.7	549.4
14	349.3	342.9	320.8	320.8	-	371.6	362.0	355.6	362.0	-	406.4	400.1	450.9	485.9	482.6	492.3	520.7	577.9	-
16	400.1	389.9	374.7	368.3	-	422.4	412.8	412.8	406.4	-	463.6	457.2	514.4	539.8	536.7	565.2	574.8	641.4	-
18	449.3	438.2	425.5	425.5	-	474.7	469.9	463.6	463.6	-	527.1	520.7	549.4	596.9	593.9	612.9	638.3	704.9	-
20	500.1	489.0	482.6	476.3	-	525.5	520.7	520.7	514.4	-	577.9	571.5	606.6	654.1	647.7	682.8	698.5	755.7	-
24	603.3	590.6	590.6	577.9	-	628.7	628.7	628.7	616.0	-	685.8	679.5	717.6	774.7	768.4	790.7	838.2	901.7	-

Please see standard when ordering gaskets for sleep on and threaded flanges.

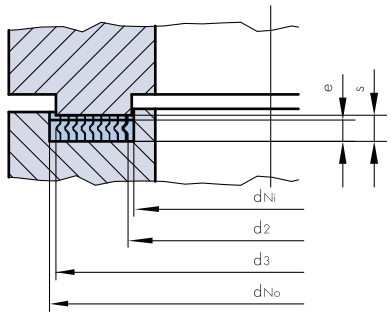
ASME B16.20:2012 Spiral wound gaskets for ASME B16.47 series A flanges

NPS (in)	d1 (mm)					d2 (mm)					d3 (mm)					d4 (mm)				
Class (lb)	150	300	400	600	900	150	300	400	600	900	150	300	400	600	900	150	300	400	600	900
26	654.1	654.1	660.4	647.7	660.4	673.1	685.8	685.8	685.8	685.8	704.9	736.6	736.6	736.6	736.6	774.7	835.2	831.9	866.9	882.7
28	704.9	704.9	711.2	698.5	711.2	723.9	736.6	736.6	736.6	736.6	755.7	787.4	787.4	787.4	787.4	831.9	898.7	892.3	914.4	946.2
30	755.7	755.7	755.7	755.7	768.4	774.7	793.8	793.8	793.8	793.8	806.5	844.6	844.6	844.6	844.6	882.7	952.5	946.2	971.6	1009.7
32	806.5	806.5	812.8	812.8	812.8	825.5	850.9	850.9	850.9	850.9	860.6	901.7	901.7	901.7	901.7	939.8	1006.6	1003.3	1022.4	1073.2
34	857.3	857.3	863.6	863.6	863.6	876.3	901.7	901.7	901.7	901.7	911.4	952.5	952.5	952.5	952.5	990.6	1057.4	1054.1	1073.2	1136.7
36	908.1	908.1	917.7	917.7	920.8	927.1	955.8	955.8	955.8	958.9	968.5	1006.6	1006.6	1006.6	1009.7	1047.8	1117.6	1117.6	1130.3	1200.2
38	958.9	952.5	952.5	952.5	1009.7	977.9	977.9	971.6	990.6	1035.1	1019.3	1016.0	1022.4	1041.4	1085.9	1111.3	1054.1	1073.2	1104.9	1200.2
40	1009.7	1003.3	1000.3	1009.7	1060.5	1028.7	1022.4	1025.7	1047.8	1098.6	1070.1	1070.1	1076.5	1098.6	1149.4	1162.1	1114.6	1127.3	1155.7	1251.0
42	1060.5	1054.1	1051.1	1066.8	1111.3	1079.5	1073.2	1076.5	1104.9	1149.4	1124.0	1120.9	1127.3	1155.7	1200.2	1219.2	1165.4	1178.1	1219.2	1301.8
44	1111.3	1104.9	1104.9	1111.3	1155.7	1130.3	1130.3	1130.3	1162.1	1206.5	1178.1	1181.1	1181.1	1212.9	1257.3	1276.4	1219.2	1231.9	1270.0	1368.6
46	1162.1	1152.7	1168.4	1162.1	1219.2	1181.1	1178.1	1193.8	1212.9	1270.0	1228.9	1228.9	1244.6	1263.7	1320.8	1327.2	1273.3	1289.1	1327.2	1435.1
48	1212.9	1209.8	1206.5	1219.2	1270.0	1231.9	1235.2	1244.6	1270.0	1320.8	1279.7	1286.0	1295.4	1320.8	1371.6	1384.3	1324.1	1346.2	1390.7	1485.9
50	1263.7	1244.6	1257.3	1270.0	-	1282.7	1295.4	1295.4	1320.8	-	1333.5	1346.2	1346.2	1371.6	-	1435.1	1378.0	1403.4	1447.8	-
52	1314.5	1320.8	1308.1	1320.8	-	1333.5	1346.2	1346.2	1371.6	-	1384.3	1397.0	1397.0	1422.4	-	1492.3	1428.8	1454.2	1498.6	-
54	1358.9	1352.6	1352.6	1378.0	-	1384.3	1403.4	1403.4	1428.8	-	1435.1	1454.2	1454.2	1479.6	-	1549.4	1492.3	1517.7	1555.8	-
56	1409.7	1403.4	1403.4	1428.8	-	1435.1	1454.2	1454.2	1479.6	-	1485.9	1505.0	1505.0	1530.4	-	1606.6	1543.1	1568.5	1612.9	-
58	1460.5	1447.8	1454.2	1473.2	-	1485.9	1511.3	1505.0	1536.7	-	1536.7	1562.1	1555.8	1587.5	-	1663.7	1593.9	1619.3	1663.7	-
60	1511.3	1524.0	1517.7	1530.4	-	1536.7	1562.1	1568.5	1593.9	-	1587.5	1612.9	1619.3	1644.7	-	1714.5	1644.7	1682.8	1733.6	-

ASME B16.20:2012 Spiral wound gaskets for ASME B16.47 series B flanges

NPS (in)	d1 (mm)					d2 (mm)					d3 (mm)					d4 (mm)				
Class (lb)	150	300	400	600	900	150	300	400	600	900	150	300	400	600	900	150	300	400	600	900
26	654.1	654.1	654.1	644.7	666.8	673.1	673.1	666.8	663.7	692.2	698.5	711.2	698.5	714.5	749.3	725.4	771.7	746.3	765.3	838.2
28	704.9	704.9	701.8	685.8	717.6	723.9	723.9	714.5	704.9	743.0	749.3	762.0	749.3	755.7	800.1	776.2	825.5	800.1	819.2	901.7
30	755.7	755.7	752.6	752.6	781.1	774.7	774.7	765.3	778.0	806.5	800.1	812.8	806.5	828.8	857.3	827.0	886.0	857.3	879.6	958.9
32	806.5	806.5	800.1	793.8	838.2	825.5	825.5	812.8	831.9	863.6	850.9	863.6	860.6	882.7	914.4	881.1	939.8	911.4	933.5	1016.0
34	857.3	857.3	850.9	850.9	895.4	876.3	876.3	866.9	889.0	920.8	908.1	914.4	911.4	939.8	971.6	935.0	993.9	962.2	997.0	1073.2
36	908.1	908.1	898.7	901.7	920.8	927.1	927.1	917.7	939.8	946.2	958.9	965.2	965.2	990.6	997.0	987.6	1047.8	1022.4	1047.8	1124.0
38	958.9	971.6	952.5	952.5	1009.7	974.9	1009.7	971.6	990.6	1035.1	1009.7	1047.8	1022.4	1041.4	1085.9	1044.7	1098.6	1073.2	1104.9	1200.2
40	1009.7	1022.4	1000.3	1009.7	1060.5	1022.4	1060.5	1025.7	1047.8	1098.6	1063.8	1098.6	1076.5	1098.6	1149.4	1095.5	1149.4	1127.3	1155.7	1251.0
42	1060.5	1085.9	1051.1	1066.8	1111.3	1079.5	1111.3	1076.5	1104.9	1149.4	1114.6	1149.4	1127.3	1155.7	1200.2	1146.3	1200.2	1178.1	1219.2	1301.8
44	1111.3	1124.0	1104.9	1111.3	1155.7	1124.0	1162.1	1130.3	1162.1	1206.5	1165.4	1200.2	1181.1	1212.9	1257.3	1197.1	1251.0	1231.9	1270.0	1368.6
46	1162.1	1178.1	1168.4	1162.1	1219.2	1181.1	1216.2	1193.8	1212.9	1270.0	1224.0	1254.3	1244.6	1263.7	1320.8	1255.8	1317.8	1289.1	1327.2	1435.1
48	1212.9	1231.9	1206.5	1219.2	1270.0	1231.9	1263.7	1244.6	1270.0	1320.8	1270.0	1311.4	1295.4	1320.8	1371.6	1306.6	1368.6	1346.2	1390.7	1485.9
50	1263.7	1267.0	1257.3	1270.0	-	1282.7	1317.8	1295.4	1320.8	-	1325.6	1355.9	1346.2	1371.6	-	1357.4	1419.4	1403.4	1447.8	-
52	1314.5	1317.8	1308.1	1320.8	-	1333.5	1368.6	1346.2	1371.6	-	1376.4	1406.7	1397.0	1422.4	-	1408.2	1470.2	1454.2	1498.6	-
54	1365.3	1365.3	1352.6	1378.0	-	1384.3	1403.4	1403.4	1428.8	-	1422.4	1454.2	1454.2	1479.6	-	1463.8	1530.4	1517.7	1555.8	-
56	1422.4	1428.8	1403.4	1428.8	-	1444.8	1479.6	1454.2	1479.6	-	1478.0	1524.0	1505.0	1530.4	-	1514.6	1593.9	1568.5	1612.9	-
58	1478.0	1484.4	1454.2	1473.2	-	1500.1	1535.2	1505.0	1536.7	-	1528.8	1573.3	1555.8	1587.5	-	1579.6	1655.8	1619.3	1663.7	-
60	1535.2	1557.3	1517.7	1530.4	-	1557.3	1589.0	1568.5	1593.9	-	1586.0	1630.4	1619.3	1644.7	-	1630.4	1706.6	1682.8	1733.6	-

LOAD BEARING GASKETS



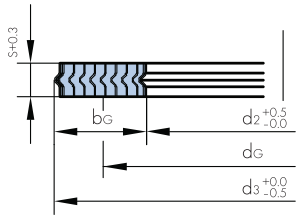
Gasket compression

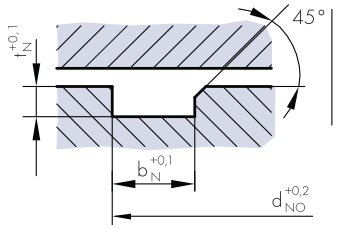
Spiral wound gaskets shall be designed in such a way that a uniform bolt stress, based on the nominal root diameter, will compress the gasket to a thickness (e).

STANDARD GASKET COMPRESSION			
s	3.2	4.5	6.5
e	$2.5^{\pm0.1}$	$3.3^{\pm0.1}$	$4.7^{\pm0.1}$

Connections with non-load bearing gaskets

Since no standards exist as yet for the use of spiral-wound gaskets in non-load-bearing connections, the application of guidelines from the adjacent table is recommended.





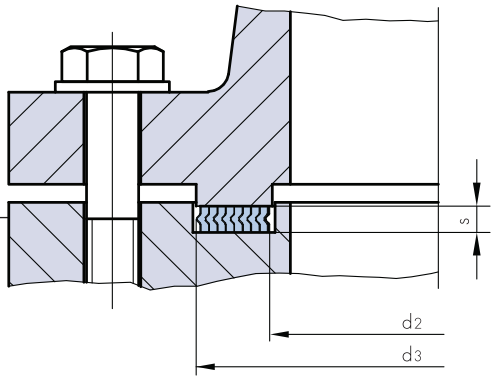
Gaskets and grooves dimensions

SPIRAL WOUND GASKET				GROOVE				
d_G	s	b_G	d_3	d_2	d_{NO}	b_N	d_{Ni}	t_n
< 300	3.2	5-9	d_G+b_G	d_G-b_G	d_3+1	$b_G/0.86$	$d_{NO}-2b_N$	$2.5^{\pm0,1}$
< 1000	3.2	9-17	d_G+b_G	d_G-b_G	$d_3+1.5$		$d_{NO}-2b_N$	$2.5^{\pm0,1}$
< 300	4.5	5-9	d_G+b_G	d_G-b_G	d_3+1		$d_{NO}-2b_N$	$3.3^{\pm0,1}$
< 1000	4.5	9-17	d_G+b_G	d_G-b_G	$d_3+1.5$		$d_{NO}-2b_N$	$3.3^{\pm0,1}$

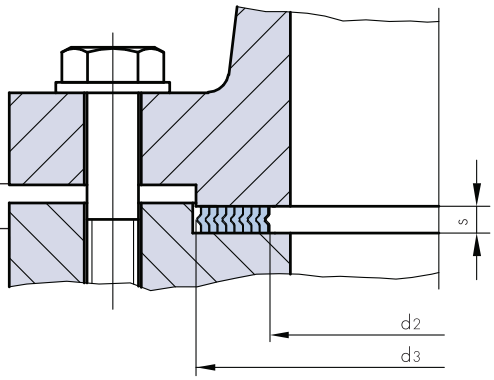
b_G - gasket width
b_N - groove width

All standard and non-standard types can be delivered in non-standard dimensions according to customer request.

EN 1092 and ASME B16.5 TONGUE and GROOVE flanges meet SWG dimensions according to ASME B16.20 or other costumer request.



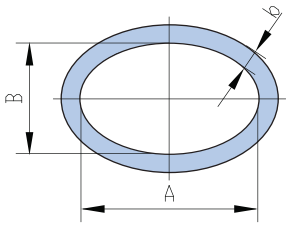
EN 1092 and ASME B 16.5 MALE and FEMALE flanges meet SWG dimensions according to ASME B 16.20 or other customer request.



NON-STANDARD SWG

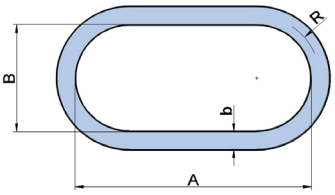
Gaskets for boilers handholes and manholes
Gaskets Type MS10 can be manufactured in other shapes like oval and oblong. There is no specific standard for this type of gasket. When ordering, complete specifications must be provided: inner dimensions (AxB), width (b) and thickness (s) or a drawing.

Oval shape



Dim.: AxBxbxs (mm)

Oblong shape



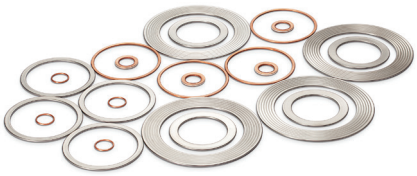
Dim.: AxBxbxs (mm)

GASKET ORDERING EXAMPLE - ASME
Type, STANDARD, DN, PN.
Specify also material combinations and design required.
Design: SWG MS16, 2¨ / 300 lbs, ASME B16.20 for ASME B16.5
Winding and inner ring material: AISI 304
Filler material: Graphite 98% purity
Centering ring: CS

GASKET ORDERING EXAMPLE - EN
Type, STANDARD, DN, PN.
Specify also material combinations and design required.
Design: SWG MS16, DN 80 / PN 16, EN 1514-2
Winding and inner ring material: Stainless steel 1.4301
Filler material: Graphite 98% purity
Centering ring: CS

GASKET ORDERING EXAMPLE - CUSTOM SIZE
Type, STANDARD, d1, d2, d3, d4
Specify also material combinations and design required.
Design: SWG MS16, Ø1620/Ø1646/Ø1684/Ø1724
Winding and inner ring material: Stainless steel 1.4301
Filler material: Graphite 98% purity
Centering ring: CS

METAL-JACKETED GASKETS

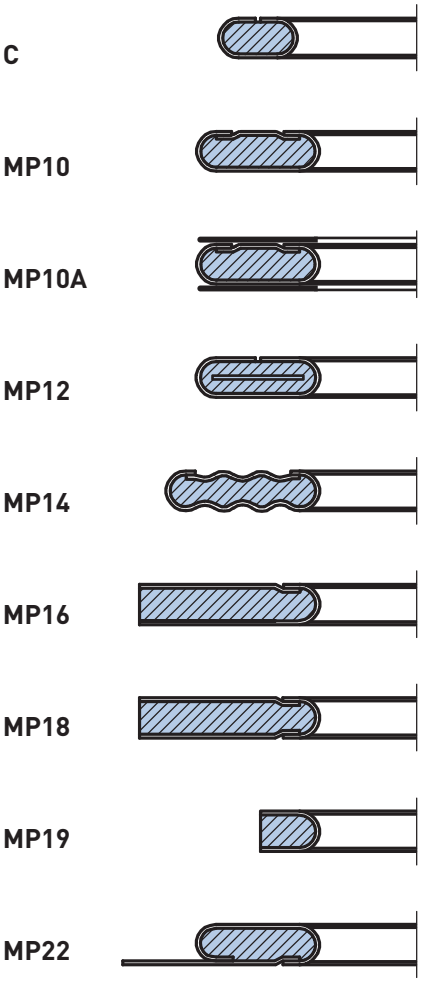


PROPERTIES AND APPLICATIONS

Metal-jacketed gaskets are particularly suitable for sealing flat surfaces of heat exchangers, gas pipes, cast iron flanges, autoclaves and similar. By their sealing efficiency, provided by exerting strong pressure on circular rims of the flanges, metal-jacketed gaskets can stand up to 30% deviation from the initial thickness, which is very useful in case of irregular or faulty flange rims. The chemical compatibility of the metal and the medium being sealed should be considered.

ADVANTAGES

Suitable for high assembly stress.
Highly resistant against blow-out.



SHAPE AND CONSTRUCTION

Metal-jacketed gaskets are produced in several types to meet the requirements of the most demanding applications. Inside a metallic jacket they feature a soft filler as shown in the figure.

Metallic Material

Material	ASTM	EN Material No.
Carbon steel	CS	1.0038 (DC04 St14)
Stainless steel	AISI 304	1.4301
Stainless steel	AISI 309	1.4828
Stainless steel	AISI 316, 316L	1.4401, 1.4404
Stainless steel	AISI 316Ti	1.4571
Stainless steel	AISI 321	1.4541
Monel (NiCu30Fe)	Alloy 400	2.4360
Copper	Copper	2.0090
Brass	Brass Ms 63	2.0321

The metallic jacket is normally 0.4 mm thick. Other materials are available on customer request.

Filler

The standard filler material is flexible graphite.
Other fillers like ceramic, mineral or other can be also used.

SIZE

The metal jacketed gaskets come in sizes according to EN 1514-4 or ASME B16.20 standards.

Maximum size:

Outer diameter: up to 4000 mm
Thickness: from 2 to 10 mm

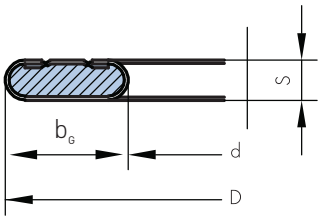
STANDARDS FOR METAL-JACKETED GASKETS USED WITH FLANGES	
METAL-JACKETED GASKETS - Standard	**Flange Standard**
EN 1514-4:1997	EN 1092-1
EN 1514-7:2004*	EN 1092-1
ASME B16.20	ASME B16.5
ASME B16.20	ASME B16.47

*EN 1514–7:2004 is valid for covered metal-jacketed gaskets

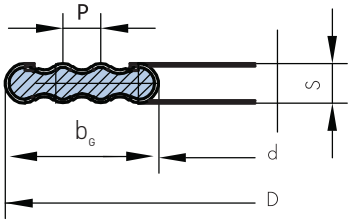
EN 1514-4:1997 Metal-jacketed gaskets for EN 1092-1 flanges

DN (mm)	Gasket inner diameter min. d (mm)	Gasket or center ring outer diameter D (mm)					
		PN10	PN16	PN25	PN40	PN63	PN100
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	-

MP10



MP14



ASME B16.20:2012 Metal-jacketed gaskets for ASME B16.5 flanges

NPS (in)	d (mm)	D (mm)						
		Class 150	Class 300	Class 400	Class 600	Class 900	Class 1500	Class 2500
1/2	22.4	44.5	50.8	50.8	50.8	60.5	60.5	66.8
3/4	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
1 1/4	47.8	73.2	79.5	79.5	79.5	85.9	85.9	101.6
1 1/2	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
2 1/2	85.9	120.7	127.0	127.0	127.0	162.2	162.2	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	533.4	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	

ASME B16.20:2012 Metal-jacketed gaskets for ASME B 16.47 series A flanges

NPS (in)	d (mm)	D (mm)				
	Class (lb)	150	300	400	600	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	1365.3
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	

ASME B16.20:2012 Metal-jacketed gaskets for ASME B 16.47 series B flanges

NPS (in)	d (mm)	D (mm)				
	Class (lb)	150	300	400	600	900
26	673.1	722.4	768.4	743.0	762.0	835.2
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	1095.5	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	1365.3
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	1511.3	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	

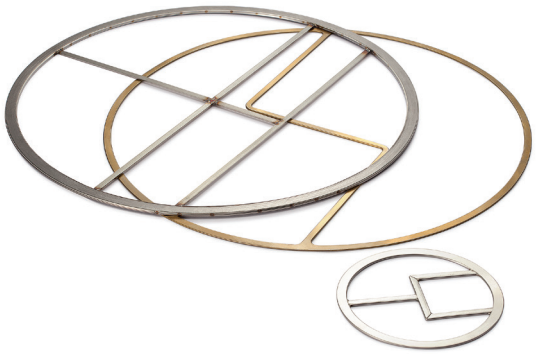
GASKET ORDERING EXAMPLE

STANDARD DIMENSION
Metal-jacketed gasket MP10,
ASME B 16.20, 8" / 600 lbs,
Material: AISI 304,
Filler: Graphite

NON-STANDARD DIMENSION
Metal-jacketed gasket MP10,
D = 836 mm, d = 804 mm, s = 3.2 mm,
Material: Cu,
Filler: Ceramic

GASKETS FOR HEAT EXCHANGERS

PROPERTIES AND APPLICATIONS



Heat exchanger gasket is a term that has been given to gaskets used in heat exchangers. The structure of the gasket or its type varies according to the operating conditions of the exchangers. The heat exchanger gaskets come in a wide spectrum of types including single or double-jacketed, corrugated, plain metal, soft and many others. A large selection of different materials allows heat exchangers to operate at temperatures beyond the capabilities of most soft gasket materials.

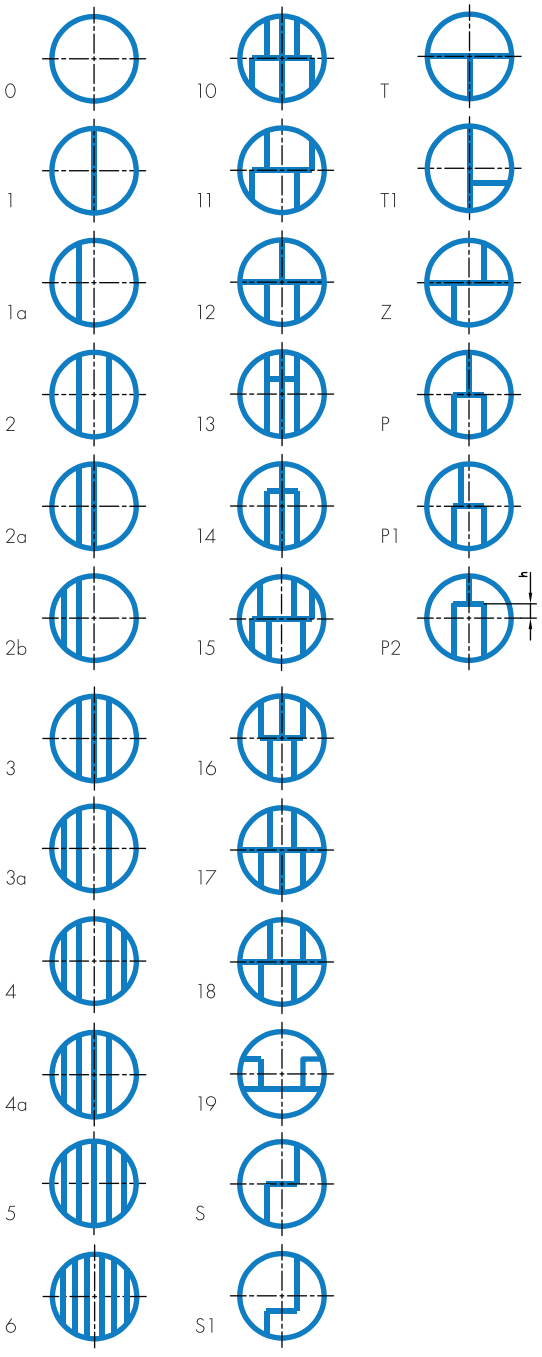
METAL-JACKETED GASKETS FOR HEAT EXC.

ADVANTAGES

- Available in wide range of materials, since they are all custom made. There are few limitations regarding size and shape.
- The metal jacket provides mechanical strength to contain the filler and improves chemical resistance.
- Unique construction provides stability and ensures trouble-free handling and installation.

SHAPE AND CONSTRUCTION

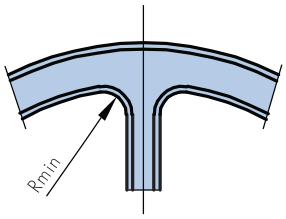
These gaskets are used in shell and tube type heat exchangers. They can be manufactured in very different sizes, shapes, with or without bars. The primary seal is at the inner diameter of the gasket, the outer gasket diameter acts as a secondary seal. The bars seal between the heat exchangers passages.
The heat exchanger gaskets are produced in several types to meet the most demanding applications. Gaskets for heat exchangers can be manufactured in metal or alloy with a thickness 0.4 mm featuring a soft core inside a metallic jacket.



Gaskets with integrated bars

Traditionally double-jacketed gaskets for heat exchangers are manufactured with integrated bars. There is a radius between the bars and an internal diameter of the gaskets.

MP10 WITH INTEGRAL BAR



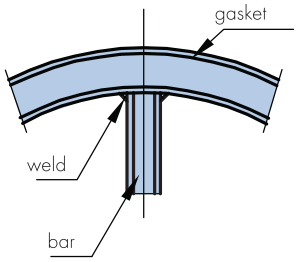
The values of the corresponding radius for the most commonly used metals and alloys are shown in the following table. If a radius is less than R_{min}, the material can crack, reducing the sealing properties of the gaskets.

GASKET MATERIALS and R_{min}	
Gasket material	**R_{min}**
Copper	8 mm
Soft iron	8 mm
Carbon steel	8 mm
Brass, Monel	10 mm
Stainless steel	10 mm

Gaskets with welded bars

Gaskets with welded bars have eliminated one of the greatest problems of conventional gaskets, namely cracks in the radius area. Metal or alloys are commercially available in sheets or rolls of 1000 mm width.

The primary and secondary seals are continuous all around the gasket. The gasket has excellent sealability, reducing leaks to the environment. The bars which seal between the heat exchangers passages are plasma or TIG welded with spot welds at each end. These welds should be soft and small to avoid areas of increased resistance to seating.



MP10 WITH WELDED BAR

Materials for heat exchanger gaskets

The selection of the jacket material depends on operating conditions. The standard filler is flexible graphite.

Metallic jacket

MATERIAL	ASTM	EN Material No.
Low carbon steel	CS	1.0038 (DC04 St14)
Stainless steel	AISI 304	1.4301
Stainless steel	AISI 309	1.4828
Stainless steel	AISI 316, AISI 316L	1.4401, 1.4404
Stainless steel	AISI 316Ti	1.4571
Stainless steel	AISI 321	1.4541
Monel (NiCu30Fe)	Alloy 400	2.4360
Copper	Copper	2.0090
Brass	Brass Ms 63	2.0321
Titanium	Titanium GR2	1.4462

Other alloys available on request.

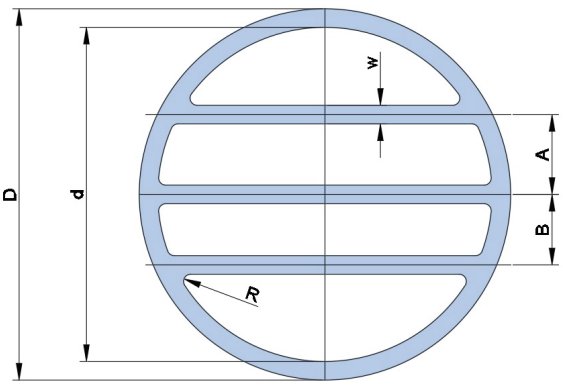
Filler

Flexible graphite, ceramic, calandered sealing materials.

SIZES

STANDARD DIMENSIONS	
Gasket thickness	3.2 mm
Gasket width	10, 13 and 16 mm
Bar width	8, 10 and 13 mm

Gaskets with outer diameter to 1000 mm are normally made with integrated bars. Gaskets with an outer diameter greater than 1000 mm are normally made with welded bars. According to the heat exchangers shapes and sizes other dimensions can be manufactured on request.



MP10

GASKET ORDERING EXAMPLE

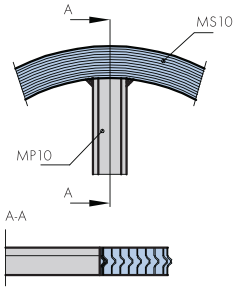
Gasket type (MP10, MP14), shape drawing dimensions: outer diameter D, inner diameter d, gasket thickness s, bar width w, radius R and distance between bars (A, B). Material for metal jacket, material for filler.

SPIRAL WOUND GASKETS FOR HEAT EXCHANGERS

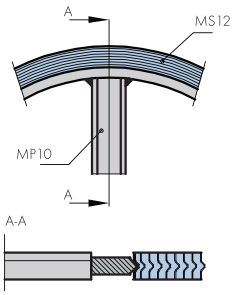
The spiral wound gaskets of MS10, MS12, MS14 or MS16 type can be manufactured with one or more metal-jacketed bars (profile MP10) in different shape shown in drawing. Metal-jacketed bars are welded and made of the same material as the spiral windings. The standard thicknesses are 3.2 mm, 4.5 mm, 6.5 mm and 7.2 mm.

MAX. DIMENSIONS	
Thickness s (mm)	Max. diameter d_3 (mm)
3.2	750
4.5	1500
6.5	2300
7.2	2300

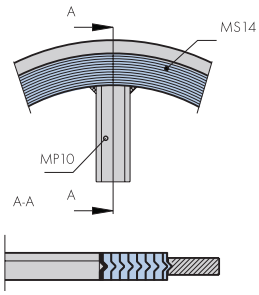
METALLIC MATERIALS		
Material	ASTM	EN Material No.
Stainless steel	AISI 304	1.4301
Stainless steel	AISI 309	1.4828
Stainless steel	AISI 316, 316L	1.4401, 1.4404
Stainless steel	AISI 316Ti	1.4571
Stainless steel	AISI 321	1.4541
Monel (NiCu30Fe)	Alloy 400	2.4360



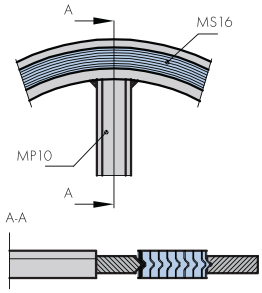
MS210



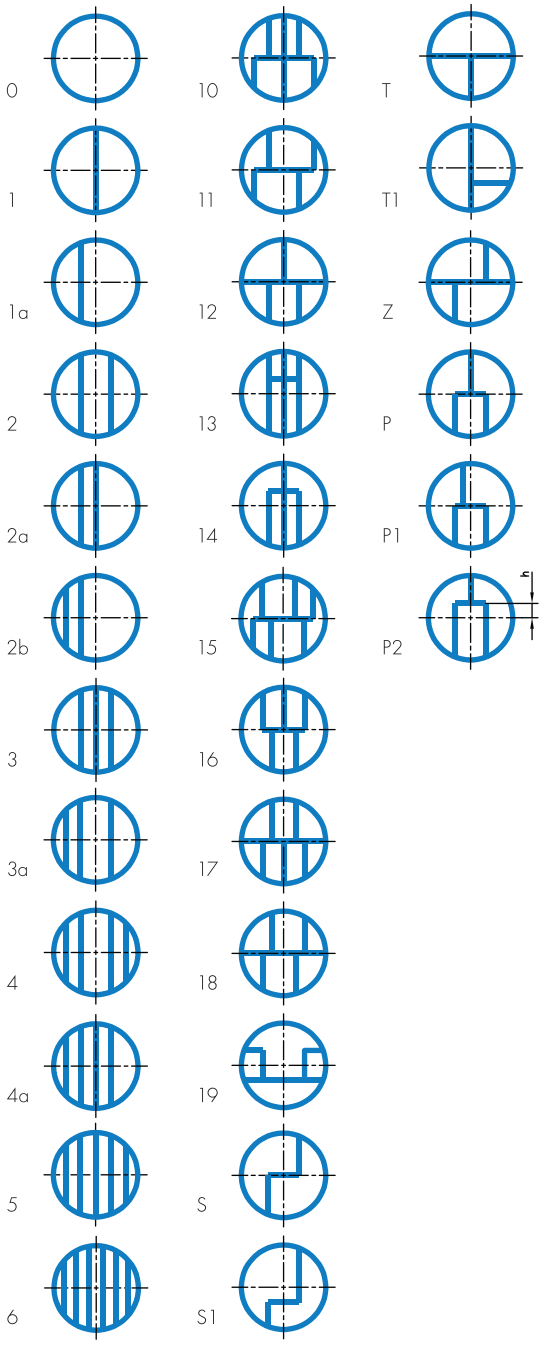
MS212



MS214



MS216



GASKET ORDERING EXAMPLE

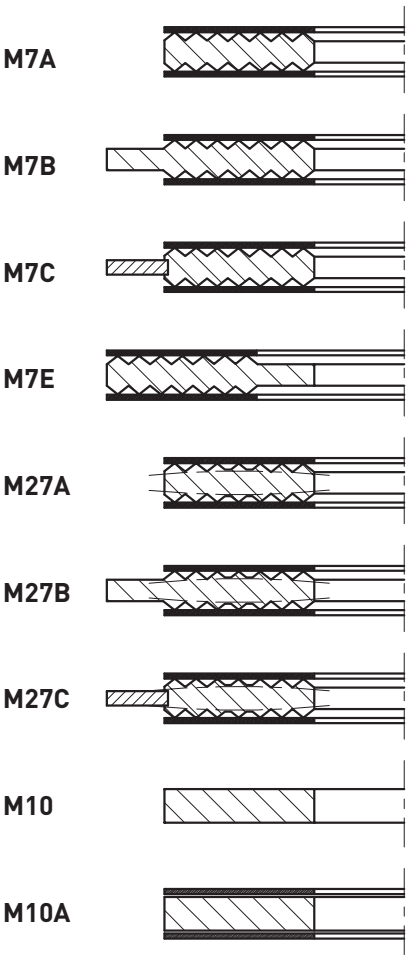
SWG, type MS212,
metal-jacketed profile (MP10),
material: AISI 316L/flexible graphite,
shape drawing with dimensions

PROPERTIES AND APPLICATIONS

The grooved gasket is the preferred gasket solution when improved performance at low seating stresses is required. It features excellent anti-blow-out properties. A tighter joint is provided with reliable solid metal to metal seal combined with a soft sealing face. Metal gaskets with grooved faces have proven to be very effective for sealing flange connections, and they are particularly suitable for applications where high temperatures, pressures and fluctuating conditions are encountered. Non-metallic cover layers ensure that flanges are not damaged, even at extreme loads, and that they provide excellent sealing properties when supported by the grooved metallic gasket. The grooved gasket can be used as an alternative for applications associated with jacketed gaskets (for heat exchangers, vessels and reactors and various flanged connections).

ADVANTAGES

Capable of sealing pressures exceeding 250 bar.
Capable of withstanding temperatures up to 700 °C.
Particularly effective in maintaining performance under condition of fluctuating temperatures and pressures.
Solid construction provides stability even for large diameters and ensures trouble-free handling and installation.
Gaskets can be fitted to existing assemblies without modification.



SHAPE AND CONSTRUCTION

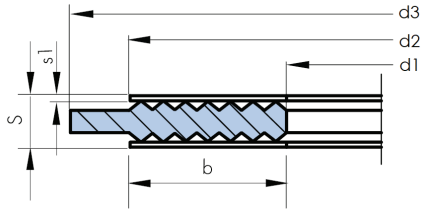
The grooved gaskets are produced in several types to fit the most demanding applications.

Metal core material

METAL CORE MATERIAL		
Material	ASTM	EN Material No.
Stainless steel	AISI 321	1.4541
Stainless steel	AISI 316Ti	1.4571
Stainless steel	AISI 304	1.4301
Stainless steel	AISI 316L	1.4404

SIZES

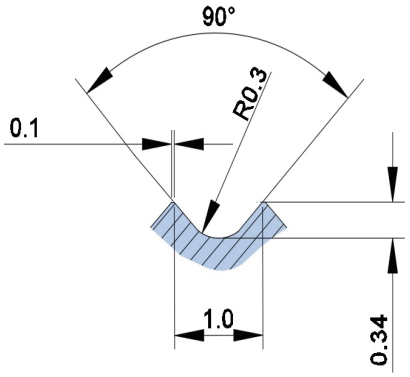
Upon request the grooved gaskets can be manufactured in various shapes and sizes.



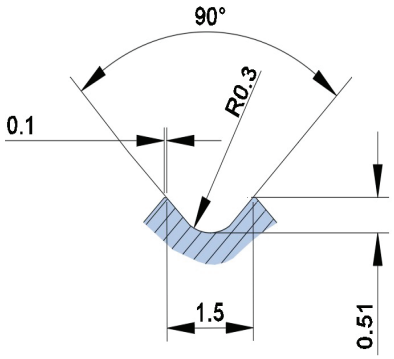
EN 12560-6:2003 Grooved gaskets for ASME B16.5 flanges

NPS (in)	d1 (mm)	d2 (mm)	d3 (mm)						
	Class (lb)		150	300	400	600	900	1500	2500
1/2	23.0	33.3	44.4	50.8	50.8	50.8	60.3	60.3	66.7
3/4	28.6	39.7	53.9	63.5	63.5	63.5	66.7	66.7	73.0
1	36.5	47.6	63.5	69.8	69.8	69.8	76.2	76.2	82.5
1 1/4	44.4	60.3	73.0	79.4	79.4	79.4	85.7	85.7	101.6
1 1/2	52.4	69.8	82.5	92.1	92.1	92.1	95.2	95.2	114.3
2	69.8	88.9	101.6	108.0	108.0	108.0	139.7	139.7	142.8
2 1/2	82.5	101.6	120.6	127.0	127.0	127.0	161.9	161.9	165.1
3	98.4	123.8	133.4	146.1	146.1	146.1	165.1	171.5	193.7
3 1/2	111.1	136.5	158.8	161.9	158.7	158.7			
4	123.8	154.0	171.5	177.8	174.6	190.5	203.2	206.4	231.7
5	150.8	182.6	193.7	212.7	209.5	238.1	244.5	250.8	276.2
6	177.8	212.7	219.1	247.7	244.5	263.5	285.8	279.4	314.3
8	228.6	266.7	276.2	304.8	301.6	317.5	355.6	349.3	384.1
10	282.6	320.7	336.5	358.8	355.6	396.9	431.8	431.8	473.0
12	339.7	377.8	406.4	419.1	415.9	454.0	495.3	517.5	546.1
14	371.5	409.6	447.7	482.6	479.4	488.9	517.5	574.7	
16	422.3	466.7	511.2	536.6	533.4	561.9	571.5	638.1	
18	479.4	530.2	546.1	593.7	590.5	609.6	635.0	701.7	
20	530.2	581.0	603.2	650.9	644.5	679.5	695.3	752.4	
22	581.0	631.8	657.2	701.7	698.5	730.3			
24	631.8	682.6	714.4	771.5	765.2	787.4	835.0	898.5	

FINE GROOVE PROFILE



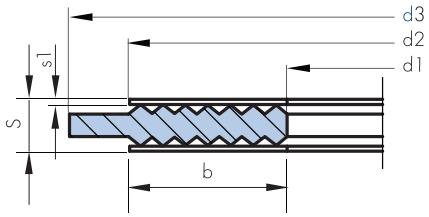
STANDARD GROOVE PROFILE



EN 1514-6:2003 Grooved gaskets for EN 1092-1 flanges

DN (mm)	d1 (mm)	d2 (mm)			d3 (mm)									
	PN Class	PN 10-40	PN 63-160	PN 250-400	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100	PN 160	PN 250	PN 320	PN 400
10	22	36	36	36	46	46	46	46	56	56	56	67	67	67
15	26	42	42	42	51	51	51	51	61	61	61	72	72	
20	31	47	47	47	61	61	61	61						
25	36	52	52	52	71	71	71	71	82	82	82	83	92	104
32	46	62	62	66	82	82	82	82						
40	53	69	69	73	92	92	92	92	103	103	103	109	119	135
50	65	81	81	87	107	107	107	107	113	119	119	124	134	150
65	81	100	100	103	127	127	127	127	137	143	143	153	170	192
80	95	115	115	121	142	142	142	142	148	154	154	170	190	207
100	118	138	138	146	162	162	168	168	174	180	180	202	229	256
125	142	162	162	178	192	192	194	194	210	217	217	242	274	301
150	170	190	190	212	217	217	224	224	247	257	257	284	311	348
175	195	215	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			
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		1017	1011	1042	1084	1108					
1000	1040	1098	1110		1124	1128	1154	1194	1220					
1200	1250	1320	1334		1341	1342	1364	1398	1452					

M7B



PROFILE	s1 (mm)
standard	1.0
fine	0.5

ASME B16.20:2012 Grooved gaskets for ASME B16.5 flanges

NPS (in)	d1 (mm)	d2 (mm)	d3 (mm)						
			Class 150	Class 300	Class 400	Class 600	Class 900	Class 1500	Class 2500
1/2	23.1	33.3	47.8	54.1	54.1	54.1	63.5	63.5	69.9
3/4	28.7	39.6	57.2	66.8	66.8	66.8	69.9	69.9	76.2
1	36.6	47.5	66.8	73.2	73.2	73.2	79.5	79.5	85.9
1 1/4	44.5	60.2	76.2	82.6	82.6	82.6	88.9	88.9	104.9
1 1/2	52.3	69.9	85.9	95.3	95.3	95.3	98.6	98.6	117.6
2	69.9	88.9	104.9	111.3	111.3	111.3	143.0	143.0	146.1
2 1/2	82.,6	101.6	124.0	130.3	130.3	130.3	165.1	165.1	168.4
3	98.3	123.7	136.7	149.4	149.4	149.4	168.4	174.8	196.9
4	123.7	153,9	174.8	181.1	177.8	193.8	206.5	209.6	235.0
5	150.9	182.6	196.9	215.9	212.9	241.3	247.7	254.0	279.4
6	177.8	212.6	222.3	251.0	247.7	266.7	289.1	282.7	317.5
8	228.6	266.7	279.4	308.1	304.8	320.8	358.9	352.6	387.4
10	282.7	320.8	339.9	362.0	358.9	400.1	435.1	435.1	476.3
12	339.6	377.7	409.7	422.4	419.1	457.2	498.6	520.7	549.4
14	371.6	409.7	450.9	485.9	482.6	492.9	520.7	577.9	
16	422.4	466.6	514.4	539.8	536.7	565.2	574.8	641.4	
18	479.3	530.1	549.4	596.9	593.9	612.9	638.3	704.9	
20	530.1	580,9	605.6	654.1	647.4	682.8	698.5	755.7	
24	631.7	682.5	717.6	774.7	768.4	790.7	838.2	901.7	

ASME B16.20:2012 Grooved gaskets for ASME B16.47 series A flanges

NPS (in)	Class 150			Class 300			Class 400			Class 600			Class 900		
	Grooved Core			Grooved Core			Grooved Core			Grooved Core			Grooved Core		
	d1 (mm)	d2 (mm)	d3 (mm)	d1 (mm)	d2 (mm)	d3 (mm)	d1 (mm)	d2 (mm)	d3 (mm)	d1 (mm)	d2 (mm)	d3 (mm)	d1 (mm)	d2 (mm)	d3 (mm)
26	673.1	704.9	774.7	685.8	736.6	835.2	685.8	736.6	831.9	685.8	736.6	866.9	685.8	736.6	882.7
28	723.9	755.7	831.9	736.6	787.4	898.7	736.6	787.4	892.3	736.6	787.4	914.4	736.6	787.4	946.2
30	774.7	806.5	882.7	793.8	844.6	952	793.8	844.6	946.2	793.8	844.6	971.6	793.8	844.6	1009.7
32	825.5	860.6	939.8	850.9	901.7	1006.6	850.9	901.7	1003.3	850.9	901.7	1022.4	850.9	901.7	1073.2
34	876.3	911.4	990.6	901.7	952.5	1057.4	901.7	952.5	1054.1	901.7	952.5	1073.2	901.7	952.5	1136.7
36	927.1	968.5	1047.8	955.8	1006.6	1117.6	955.8	1006.6	1117.6	955.8	1006.6	1130.3	958.9	1009.7	1200.2
38	977.9	1019.3	1111.3	977.9	1016	1054.1	971.6	1022.4	1073.2	990.6	1041.4	1104.9	1035.1	1085.9	1200.2
40	1028.7	1070.1	1162.1	1022.4	1070.1	1114.6	1025.7	1076.5	1127.3	1047.8	1098.6	1155.7	1098.6	1149.4	1251
42	1079.5	1124	1219.2	1073.2	1120.9	1165.4	1076.5	1127.3	1178.1	1104.9	1155.7	1219.2	1149.4	1200.2	1301.8
44	1130.3	1178.1	1276.4	1130.3	1181.1	1219.2	1130.3	1181.1	1231.9	1162.1	1212.9	1270	1206.5	1257.3	1368.6
46	1181.1	1228.9	1327.2	1178.1	1228.9	1273.3	1193.8	1244.6	1289.1	1212.9	1263.7	1327.2	1270	1320.8	1435.1
48	1231.9	1279.7	1384.3	1235.2	1286	1324.1	1244.6	1295.4	1346.2	1270	1320.8	1390.7	1320.8	1371.6	1485.9
50	1282.7	1333.5	1435.1	1295.4	1346.2	1378	1295.4	1346.2	1403.4	1320.8	1371.6	1447.8	-	-	-
52	1333.5	1384.3	1492.3	1346.2	1397	1428.8	1346.2	1397	1454.2	1371.6	1422.4	1498.6	-	-	-
54	1384.3	1435.1	1549.4	1403.4	1454.2	1429.3	1403.4	1454.2	1517.7	1428.8	1479.6	1555.8	-	-	-
56	1435.1	1485.9	1606.6	1454.2	1505	1543.1	1454.2	1505	1568.5	1479.6	1530.4	1612.9	-	-	-
58	1485.9	1536.7	1663.7	1511.3	1562.1	1593.9	1505	1555.8	1619.3	1536.7	1587.5	1663.7	-	-	-
60	1536.7	1587.5	1714.5	1562.1	1612.9	1644.7	1568.5	1619.3	1682.8	1593.9	1644.7	1733.6	-	-	-

ASME B16.20:2012 Grooved gaskets for ASME B16.47 series B flanges

NPS (in)	Class 150			Class 300			Class 400			Class 600			Class 900		
	Grooved Core			Grooved Core			Grooved Core			Grooved Core			Grooved Core		
	d1 (mm)	d2 (mm)	d3 (mm)	d1 (mm)	d2 (mm)	d3 (mm)	d1 (mm)	d2 (mm)	d3 (mm)	d1 (mm)	d2 (mm)	d3 (mm)	d1 (mm)	d2 (mm)	d3 (mm)
26	673.1	698.5	725.4	673.1	711.2	771.7	666.8	698.5	746.3	663.7	714.5	765.3	692.2	749.3	838.2
28	723.9	749.3	776.2	723.9	762	825.5	714.5	749.3	800.1	704.9	755.7	819.2	743	800.1	901.7
30	774.7	800.1	827	774.7	812.8	886	765.3	806.5	857.3	778	828.8	879.6	806.5	857.3	958.9
32	825.5	850.9	881.1	825.5	863.6	939.8	812.8	860.6	911.4	831.9	882.7	933.5	863.6	914.4	1016
34	876.3	908.1	935	876.3	914.4	993.9	866.9	911.4	962.2	889	939.8	997	920.8	971.6	1073.2
36	927.1	958.9	987.6	927.1	965.2	1047.8	917.7	965.2	1022.4	939.8	990.6	1047.8	946.2	997	1124
38	974.9	1009.7	1044.7	1009.7	1047.8	1098.6	971.7	1022.4	1073.2	990.6	1041.4	1104.9	1035.1	1085.9	1200.2
40	1022.4	1063.8	1095.5	1060.5	1098.6	1149.4	1025.7	1076.5	1127.3	1047.8	1098.6	1155.7	1098.6	1149.4	1251
42	1079.5	1114.6	1146.3	1111.3	1149.4	1200.2	1076.5	1127.3	1178.1	1104.9	1155.7	1219.2	1149.4	1200.2	1301.8
44	1124	1165.4	1197.1	1162.1	1200.2	1251	1130.3	1181.1	1231.9	1162.1	1212.9	1270	1206.5	1257.3	1368.6
46	1181.1	1224	1255.8	1216.2	1254.3	1317.8	1193.8	1244.6	1289.1	1212.9	1263.7	1327.2	1270	1320.8	1435.1
48	1231.9	1270	1306.6	1263.7	1311.4	1368.6	1244.6	1295.4	1346.2	1270	1320.8	1390.7	1320.8	1371.6	1485.9
50	1282.7	1325.6	1357.4	1317.8	1355.9	1419.4	1295.4	1346.2	1403.4	1320.8	1371.6	1447.8	-	-	-
52	1333.5	1376.4	1408.2	1368.6	1406.7	1470.2	1346.2	1397	1454.2	1371.6	1422.4	1498.6	-	-	-
54	1384.3	1422.4	1463.8	1403.4	1454.2	1530.4	1403.4	1454.2	1517.7	1428.8	1479.6	1555.8	-	-	-
56	1444.8	1478	1514.6	1479.6	1524	1593.9	1454.2	1505	1568.5	1479.6	1530.4	1612.9	-	-	-
58	1500.6	1528.8	1579.6	1535.2	1573.3	1655.8	1505	1555.8	1619.3	1536.7	1587.5	1663.7	-	-	-
60	1557.3	1586	1630.4	1589	1630.4	1706.6	1568.5	1619.3	1682.8	1593.9	1644.7	1733.6	-	-	-

GASKET ORDERING EXAMPLE

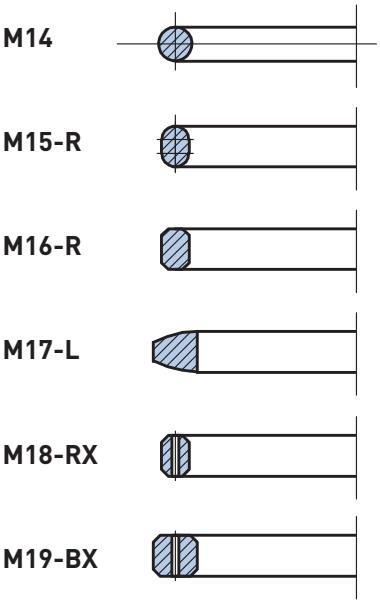
Grooved gasket M7A, fine profile
EN 1514-6, DN 80 / PN 40,
material: 1.4541/Graphite 99.85% purity

PROPERTIES AND APPLICATIONS

The metallic ring joint gaskets are manufactured according to the API 6A and ASME B16.20 standards for application at elevated temperatures and pressures. The small sealing area with high contact pressure results in great reliability. The contact surfaces of the gaskets and flange should be carefully processed. Some types of ring joints are pressure activated, which means, the higher the pressure the better the sealability.

ADVANTAGES

The metal ring joint gaskets have been designed to withstand exceptionally high assembly loads over a small area, thus producing high seating stresses.



SHAPE AND CONSTRUCTION

The ring joint gaskets are produced in several shapes and sizes to meet the most demanding applications.

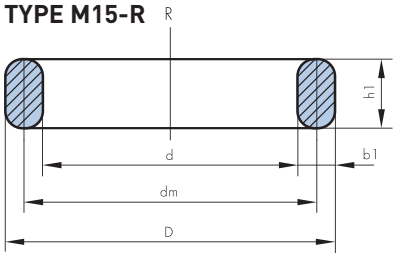
STANDARD MATERIALS

STANDARD MATERIALS RECOMMENDED BY THE ASME B16.20				
ASTM	EN Material No.	Maximum HB "Brinell"	Maximum HRb "Rockwell B"	Material code
Soft Iron	1.1003	90	56	D
Low carbon steel	1.0038	120	68	S
4-6 chrome ½ Mo	1.7362 (AISI 501)	130	72	F5
AISI 410	1.4000	170	86	S410
AISI 304	1.4301	160	83	S304
AISI 316	1.4401	160	83	S316
AISI 347	1.4550	160	83	S347

DIMENSIONS

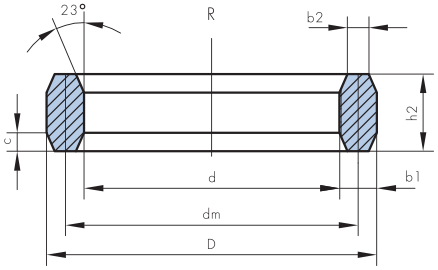
STANDARDS FOR RING JOINT GASKETS USED WITH FLANGES		
Ring joints gaskets type	Ring joints gaskets standard	Flange standard
R	ASME B16.20, API 6A	ASME B16.5, ASME B16.47
RX	ASME B16.20, API 6A	API 6B
BX	API 6A	API 6BX

TYPE M15-R



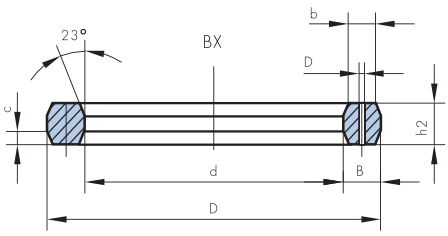
OVAL SECTION

TYPE M16-R

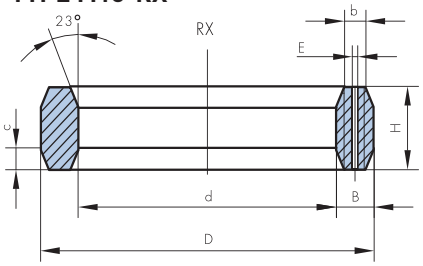


OCTAGONAL SECTION

TYPE M19-BX



TYPE M18-RX



GASKET ORDERING EXAMPLE

RING-JOINT GASKET API 6A,
R30-oval, material: AISI 321

ASME B16.20:2012 Type R ring gasket dimensions and tolerances

Tolle-rances	/	/	± 0.18	+ 1.3 - 0.5	+ 1.3 - 0.5	± 0.20
R	DIMENSIONS (mm)					
	D	d	d_m	h_1	h_2	b_1
R 11	40.49	27.79	34.14	11.20	9.70	6.35
R 12	47.65	31.75	39.70	14.20	12.70	7.95
R 13	50.83	34.93	42.88	14.20	12.70	7.95
R 14	52.40	36.50	44.45	14.20	12.70	7.95
R 15	55.58	39.68	47.63	14.20	12.70	7.95
R 16	58.75	42.85	50.80	14.20	12.70	7.95
R 17	65.10	49.20	57.15	14.20	12.70	7.95
R 18	68.28	52.38	60.33	14.20	12.70	7.95
R 19	73.05	57.15	65.10	14.20	12.70	7.95
R 20	76.23	60.33	68.28	14.20	12.70	7.95
R 21	83.37	61.11	72.24	17.50	16	11.13
R 22	90.50	74.60	82.55	14.20	12.70	7.95
R 23	93.68	71.42	82.55	17.50	16	11.13
R 24	106.38	84.12	95.25	17.50	16	11.13
R 25	109.55	93.65	101.60	14.20	12.70	7.95
R 26	112.73	90.47	101.60	17.50	16	11.13
R 27	119.08	96.82	107.95	17.50	16	11.13
R 28	123.83	98.43	111.13	19.10	17.50	12.70
R 29	122.25	106.35	114.30	14.20	12.70	7.95
R 30	128.61	106.35	117.48	17.50	16	11.13
R 31	134.96	112.70	123.83	17.50	16	11.13
R 32	139.70	114.30	127	19.10	17.50	12.70
R 33	139.73	123.83	131.78	14.20	12.70	7.95
R 34	142.91	120.65	131.78	17.50	16	11.13
R 35	147.66	125.40	136.53	17.50	16	11.13
R 36	157.18	141.28	149.23	14.20	12.70	7.95
R 37	160.36	138.10	149.23	17.50	16	11.13
R 38	173.06	141.30	157.18	22.40	20.60	15.88
R 39	173.06	150.80	161.93	17.50	16	11.13
R 40	179.40	163.50	171.45	14.20	12.70	7.95
R 41	192.11	169.85	180.98	17.50	16	11.13
R 42	209.55	171.45	190.50	25.40	23.90	19.05
R 43	201.63	185.73	193.68	14.20	12.70	7.95
R 44	204.81	182.55	193.68	17.50	16	11.13
R 45	222.28	200.02	211.15	17.50	16	11.13
R 46	223.85	198.45	211.15	19.10	17.50	12.70
R 47	247.65	209.55	228.60	25.40	23.90	19.05
R 48	255.60	239.70	247.65	14.20	12.70	7.95
R 49	281.01	258.75	269.88	17.50	16	11.13
R 50	285.76	254.00	269.88	22.40	20.60	15.88
R 51	301.63	257.17	279.40	28.70	26.90	22.23
R 52	312.75	296.85	304.80	14.20	12.70	7.95
R 53	334.98	312.72	323.85	17.50	16	11.13
R 54	339.73	307.97	323.85	22.40	20.60	15.88
R 55	371.48	314.32	342.90	36.60	35.10	28.58
R 56	388.95	373.05	381	14.20	12.70	7.95
R 57	392.13	369.87	381	17.50	16	11.13

Tolle-rances	/	/	± 0.18	+ 1.3 - 0.5	+ 1.3 - 0.5	± 0.20
R	DIMENSIONS (mm)					
	D	d	d_m	h_1	h_2	b_1
R 58	403.23	358.77	381	28.70	26.90	22.23
R 59	404.83	388.93	396.88	14.20	12.70	7.95
R 60	438.15	374.65	406.40	39.60	38.10	31.75
R 61	430.23	407.97	419.10	17.50	16	11.13
R 62	434.98	403.22	419.10	22.40	20.60	15.88
R 63	444.50	393.70	419.10	33.30	31.80	25.40
R 64	461.98	446.08	454.03	14.20	12.70	7.95
R 65	481.03	458.77	469.90	17.50	16	11.13
R 66	485.78	454.02	469.90	22.40	20.60	15.88
R 67	498.48	441.32	469.90	36.60	35.10	28.58
R 68	525.48	509.58	517.53	14.20	12.70	7.95
R 69	544.53	522.27	533.40	17.50	16	11.13
R 70	552.45	514.35	533.40	25.40	23.90	19.05
R 71	561.98	504.82	533.40	36.60	35.10	28.58
R 72	566.75	550.85	558.80	14.20	12.70	7.95
R 73	596.90	571.50	584.20	19.10	17.50	12.70
R 74	603.25	565.15	584.20	25.40	23.90	19.05
R 75	615.95	552.45	584.20	39.60	38.10	31.75
R 76	681.05	665.15	673.10	14.20	12.70	7.95
R 77	708.03	676.27	692.15	22.40	20.60	15.88
R 78	717.55	666.75	692.15	33.30	31.80	25.40
R 79	727.08	657.22	692.15	44.50	41.40	34.93
R 80	623.90	608.00	615.95	-	12.70	7.95
R 81	649.30	620.70	635	-	19.10	14.30
R 82	68.28	46.02	57.15	-	16	11.13
R 84	74.63	52.37	63.50	-	16	11.13
R 85	92.08	66.68	79.38	-	17.50	12.70
R 86	106.38	74.62	90.50	-	20.60	15.88
R 87	115.91	84.15	100.03	-	20.60	15.88
R 88	142.88	104.78	123.83	-	23.90	19.05
R 89	133.35	95.25	114.30	-	23.90	19.05
R 90	177.81	133.35	155.58	-	26.90	22.23
R 91	292.10	228.60	260.35	-	38.10	31.75
R 92	239.73	217.47	228.60	17.50	16	11.13
R 93	768.35	730.25	749.30	-	23.90	19.05
R 94	819.15	781.05	800.10	-	23.90	19.05
R 95	876.30	838.20	857.25	-	23.90	19.05
R 96	936.63	892.17	914.40	-	26.90	22.23
R 97	987.43	942.97	965.20	-	26.90	22.23
R 98	1044.58	1000.12	1022.35	-	26.90	22.23
R 99	246.08	223.82	234.95	-	16	11.13
R 100	777.88	720.72	749.30	-	35.10	28.58
R 101	831.85	768.35	800.10	-	38.10	31.75
R 102	889.00	825.50	857.25	-	38.10	31.75
R 103	946.15	882.65	914.40	-	38.10	31.75
R 104	1000.13	930.27	965.20	-	41.40	34.93
R 105	1057.28	987.42	1022.35	-	41.40	34.93

ASME B16.20:2012 Type BX ring gasket dimensions and tolerances

Tolle-rances	+0.0 - 0.15	/	+0.2 - 0.0	+0.2 - 0.0	± 0.5
R	DIMENSIONS (mm)				
	D	d	h_2	B	E
BX-150	72.19	53.59	9.3	9.3	1.5
BX-151	76.4	57.14	9.63	9.63	1.5
BX-152	84.68	64.2	10.24	10.24	1.5
BX-153	100.94	78.18	11.38	11.38	1.5
BX-154	116.84	92.04	12.4	12.4	1.5
BX-155	147.96	119.52	14.22	14.22	1.5
BX-156	237.92	200.68	18.62	18.62	3
BX-157	294.46	252.5	20.98	20.98	3
BX-158	352.04	305.76	23.14	23.14	3
BX-159	426.72	375.32	25.7	25.7	3
BX-160	402.59	375.11	23.83	13.74	3
BX-161	491.41	458.99	28.07	16.21	3

Tolle-rances	+0.0 - 0.15	/	+0.2 - 0.0	+0.2 - 0.0	± 0.5
R	DIMENSIONS (mm)				
	D	d	h_2	B	E
BX-162	475.49	447.05	14.22	14.22	1.5
BX-163	556.16	521.42	30.1	17.37	3
BX-164	570.56	521.38	30.1	24.59	3
BX-165	624.71	587.73	32.03	18.49	3
BX-166	640.03	587.75	32.03	26.14	3
BX-167	759.36	733.14	35.86	13.11	1.5
BX-168	765.25	733.15	35.86	16.05	1.5
BX-169	173.51	147.65	15.85	12.93	1.5
BX-170	218.03	189.59	14.22	14.22	1.5
BX-171	267.44	239	14.22	14.22	1.5
BX-172	333.07	304.63	14.22	14.22	1.5
BX-303	852.75	818.81	37.95	16.97	1.5

ASME B16.20:2012 Type RX ring gasket dimensions and tolerances

Tolle-rances	+0.51 - 0	/	+0.2 - 0	+0.2 - 0	± 0.5
R	DIMENSIONS (mm)				
	D	d	B	H	E
RX-20	76.20	66.96	8.74	19.05	-
RX-23	93.27	80.37	11.91	25.40	-
RX-24	105.97	93.07	11.91	25.40	-
RX-25	109.55	100.31	8.74	19.05	-
RX-26	111.91	99.01	11.91	25.40	-
RX-27	118.26	105.36	11.91	25.40	-
RX-31	134.54	121.64	11.91	25.40	-
RX-35	147.24	134.34	11.91	25.40	-
RX-37	159.94	147.04	11.91	25.40	-
RX-39	172.64	159.74	11.91	25.40	-
RX-41	191.69	178.79	11.91	25.40	-
RX-44	204.39	191.49	11.91	25.40	-
RX-45	221.84	208.94	11.91	25.40	-
RX-46	222.25	208.89	13.49	28.58	-
RX-47	245.26	224.58	19.84	41.28	-
RX-49	280.59	267.69	11.91	25.40	-
RX-50	283.36	266.34	16.66	31.75	-
RX-53	334.57	321.67	11.91	25.40	-
RX-54	337.34	320.32	16.66	31.75	-
RX-57	391.72	378.82	11.91	25.40	-
RX-63	441.73	412.17	27.00	50.80	-
RX-65	480.62	467.72	11.91	25.40	-
RX-66	457.99	440.97	16.66	31.75	-
RX-69	544.12	531.22	11.91	25.40	-
RX-70	550.06	529.38	19.84	41.28	-
RX-73	596.11	582.75	13.49	31.75	-
RX-74	600.86	580.18	19.84	41.28	-
RX-82	67.87	54.97	11.91	25.40	1.5
RX-84	74.22	61.32	11.91	25.40	1.5
RX-85	90.09	76.73	13.49	25.40	1.5
RX-86	103.58	86.56	15.09	28.58	2.3
RX-87	113.11	96.09	15.09	28.58	2.3
RX-88	139.29	118.61	17.48	31.75	3.0
RX-89	129.77	109.09	18.26	31.75	3.0
RX-90	174.63	150.29	19.84	44.45	3.0
RX-91	286.94	247.32	30.18	45.24	3.0
RX-99	245.67	232.77	11.91	25.40	-
RX-201	51.46	45.06	5.74	11.30	-
RX-205	62.31	56.21	5.56	11.10	-
RX-210	97.64	86.82	9.53	19.05	-
RX-215	140.89	130.23	11.91	25.40	-

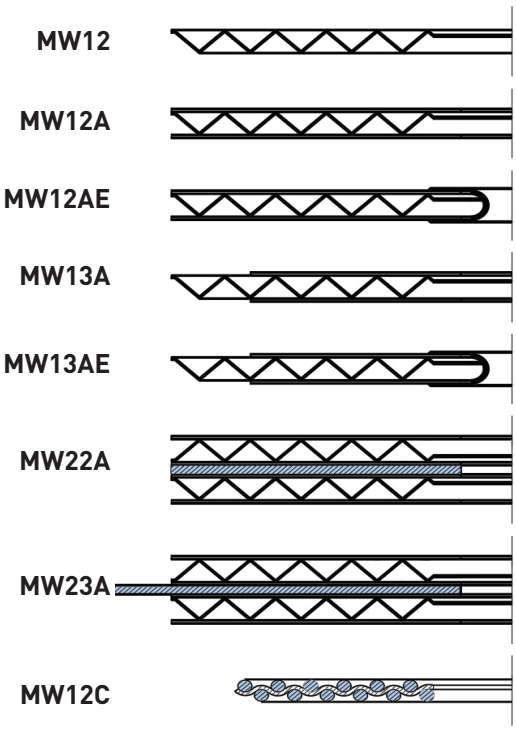
PROPERTIES AND APPLICATIONS

Corrugated gaskets without layer

There are different types of metal gaskets, like flat, grooved, tongue and sectional ones. They are used where compressibility (elasticity) of sealing material is not required. The construction of such gaskets based on the principle of different hardness of adjacent materials. These gaskets come in various shapes and there are almost no limits concerning their size. The corrugated metal gaskets have been proven to be both reliable and cost-effective for the application on flanges and heads where bolt loading is sufficient. Their operation principle is based on different degrees of hardness of adjacent materials. The sealing effect is produced by the constant load to which a gasket is exposed. They are used in applications, which require mechanical strength and thermal conductivity, as well as temperature and corrosion resistance. They are particularly useful when compressibility is not a factor and where sufficient clamping force is available. Metal gaskets feature greater mechanical strength, better heat transfer and resistance to higher temperatures and pressures, and can offer advantages over the clad type gaskets in certain applications.

Corrugated gaskets with soft layer

Corrugated metal is covered with graphite, ceramic or PTFE layers. An additional finishing layer is applied depending on the requirements of the medium to be sealed. Such gaskets are used on uneven or distorted sealing surfaces, where more elastic materials with better sealing performance are needed. The corrugated metal gaskets with soft layer on both sides are used in low-pressure applications in large diameter flue gas ducts at high temperatures. The use of corrugated gaskets eliminates the problem of difficult handling with large non-metal gaskets used in those applications. They are suitable for gas pipes and valve caps, or wherever acids, oils and chemicals are found. They can be used at lower pressures and higher temperatures.

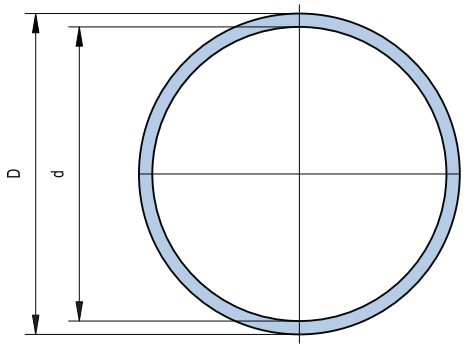


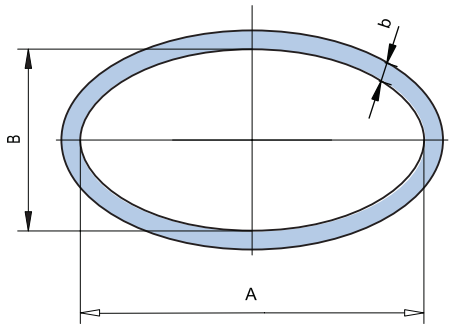
ADVANTAGES

- Outstanding mechanical strength and thermal conductivity.
- Capable of withstanding high temperatures.
- There are almost no limitations regarding size.
- Solid construction provides stability even for large diameters and ensures trouble-free handling and installation.

SHAPE AND CONSTRUCTION

The metal gaskets are produced in several types to meet the most demanding applications. Shapes: round, oval, rectangular etc.





Type: AxBxb (oval)

MATERIALS FOR METAL AND CORRUGATED METAL GASKETS		
Material	**ASTM**	**EN (DIN) Material No.**
Low carbon steel	Soft iron (CS)	1.0333
Stainless steel	AISI 304	1.4301
Stainless steel	AISI 309	1.4828
Stainless steel	AISI 316, AISI 316L	1.4401, 1.4404
Stainless steel	AISI 316Ti	1.4571
Stainless steel	AISI 321	1.4541

EN 1514-4:1997 Corrugated gaskets for EN 1092-1 flanges

PN / DN	d1 (mm)	d2 (mm)					
	10 - 100	10	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	330	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 12560-4:2001 Corrugated gaskets for ASME B16.5 flanges

DN	Class / NPS	d1 (mm)	d2 (mm)					
		150 - 2500	150	300	600	900	1500	2500
15	1/2"	22.0	47.6	54.0	54.0	63.5	63.5	69.9
20	3/4"	27.0	57.2	66.7	66.7	69.9	69.9	76.2
25	1"	34.0	66.7	73.0	73.0	79.4	79.4	85.7
32	1 1/4"	43.0	76.2	82.6	82.6	88.9	88.9	104.8
40	1 1/2"	49.0	85.7	95.3	95.3	98.4	98.4	117.5
50	2"	61.0	104.8	111.1	111.1	142.9	142.9	146.1
65	2 1/2"	73.0	123.8	130.2	130.2	165.1	165.1	168.3
80	3"	89.0	136.5	149.2	149.2	168.3	174.6	196.9
100	4"	115.0	174.6	181.0	193.7	206.4	209.6	235.0
125	5"	141.0	196.9	215.9	241.3	247.7	254.0	279.4
150	6"	169.0	222.3	250.8	266.7	288.9	282.6	317.5
200	8"	220.0	279.4	308.0	320.7	358.8	352.4	387.4
250	10"	273.0	339.7	362.0	400.1	435.0	435.0	476.3
300	12"	324.0	409.6	422.3	457.2	498.5	520.7	549.2
350	14"	356.0	450.9	485.8	492.1	520.7	577.9	
400	16"	407.0	514.4	539.8	565.2	574.7	641.4	
450	18"	458.0	549.3	596.9	612.8	638.2	704.9	
500	20"	508.0	606.4	654.1	682.6	698.5	755.7	
600	24"	610.0	717.6	774.7	790.6	838.2	901.7	

SIZE

Gaskets with an outer diameter up to 1000 mm are usually made in one piece, while larger dimensions are welded. Welding is also recommended for cost-effectiveness.

Profile

The metal is 0.5 mm thick and the corrugation pitch is 3 mm, 4 mm, 5 mm or 6 mm depending on the width and size of the gaskets. The thickness of corrugation is approx. 1 mm to 1.5 mm, depending on gasket size. Corrugated metal is covered with graphite, ceramic or PTFE layers in thickness 0.5 mm to 2 mm.

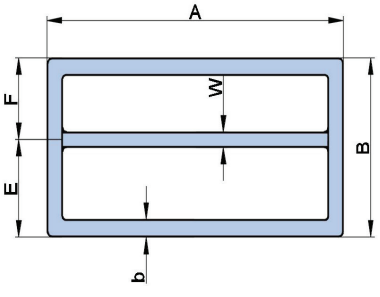
GASKET ORDERING EXAMPLE

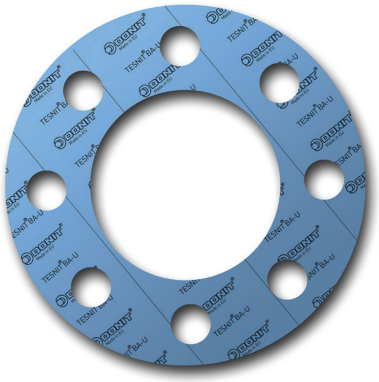
STANDARD SIZE:

CORRUGATED GASKET MW12A, EN 1514-4, DN 100 / PN 40, material: 1.4571/Graphite 99.85% purity

NON-STANDARD DIMENSION:

CORRUGATED GASKET MW12A, D=946 mm, d=914 mm, s=3.5 mm, material: AISI 316Ti/Graphite 99.85% purity





PROPERTIES AND APPLICATIONS

The non-metallic or flat gaskets are the most typical ones from the family of flat static gaskets. They are used in large numbers by various industries and in a variety of applications. Soft gaskets are made of non-asbestos (CSF), graphite, PTFE, mica, aramid/ graphite and rubber sealing materials. Available in standard and non-standard gasket design.

Table notes:
(1) Engineered bio-soluble mineral fibers, aramid fibers
(2) Engineered bio-soluble mineral fibers

Gasket materials and applications

Standard Line	Composition	Max.T (°C/°F)	Max. p (bar/psi)	Properties	Applications
BA-202	Organic fibers, NBR	140/284	40/580	Material has good mechanical and sealing properties. It has been designed for non-demanding applications.	General purpose, water supply, shipbuilding.
BA-203	Aramid fibers, NBR	200/392	50/725	Material with good thermal resistance, designed for less demanding applications.	General purpose, water supply, shipbuilding.
BA-50	Aramid fibers, NBR	220/428	80/1160	Material has good thermal, chemical, and dynamic resistance.	General purpose, water supply, potable water supply, gas supply, food industry, automotive and engine building industry.
BA-55	Synthetic fibers(1), NBR	270/518	100/1450	Material has good thermal and chemical properties and resistance to steam.	General purpose, potable water supply, steam supply, gas supply, food industry, heating systems.
BA-U	Aramid fibers, NBR	250/482	100/1450	Material for general purpose with good mechanical and thermal properties and low gas permeability.	General purpose, gas supply, petrochemical industry, food industry, shipbuilding, refrigeration and cooling.
BA-CF	Carbon fibers, NBR	300/572	120/1740	Material has excellent thermal properties and very good chemical resistance to steam and strong alkaline media.	Steam supply, gas supply, chemical industry, petrochemical industry, paper and cellulose industries, high temp. applications.
BA-M	Synthetic fibers(1), NBR	350/662	120/1740	Material possesses excellent thermomechanical properties, especially bolt torque retention.	Steam supply, paper and cellulose industries, power plant, refrigeration and cooling, heating systems, high temp. applications.
BA-GL	Glass fibers, NBR, aramid fibers	350/662	120/1740	This material combines excellent thermal, chemical and mechanical properties. It has outstanding bolt torque retention.	Steam supply, gas supply, shipbuilding, power plant, heating systems, high temp. applications.
BA-R	Aramid fibers, NBR, wire reinforcement	350/662	140/2030	This material combines very good resistance to high internal and surface pressure, with good thermal properties. It has high bolt torque retention.	Automotive and engine building industry, shipbuilding.
BA-REM	Glass fibers, aramid fibers, NBR, expanded metal	370/698	150/2175	This material combines excellent resistance to high internal and surface pressure, with good thermal properties. It has outstanding bolt torque retention.	Steam supply, petrochemical industry, shipbuilding, power plant, high temp. applications.
BA-R300	Inorganic fibers(2), NBR, special reinforcement	450/842	/	Material has outstanding dynamic and thermal resistance.	Steam supply, automotive and engine building industry, shipbuilding, power plant, high temp. applications.
BA-R302	Inorganic fibers(2), NBR, special reinforcement	600/1112	/	Material has superior thermal resistance coupled with excellent mechanical properties and blowout safety.	Steam supply, automotive and engine building industry, shipbuilding, power plant, high temp. applications.

Temperature and pressure represent maximum values and should not be used simultaneously. They are given only as guidance, since they depend not only on the type of gasket material but also on the assembly conditions. Very important factors are thickness of material, nature of service medium, type of flange and surface pressure. Steam application requires special considerations.

		Basis	Max. T (°C/°F)	Max. p (bar/psi)	Properties	Applications
Graphite sealing materials						
GRAFILIT®	SF	Expanded natural graphite	(Oxidizing atmosphere) 550 / 1022	80 / 1160	This material has excellent chemical and thermal resistance, combined with high compressibility.	Water supply, potable water supply, chemical industry, petrochemical industry, refrigeration and cooling, high temp. applications.
	SL	Expanded natural graphite, stainless steel foil insert (AISI 316; 0.05 mm).		100 / 1450	Material designed for high operating pressures with excellent chemical and thermal resistance.	Potable water supply, steam supply, chemical industry, power plant, heating systems, high temp. applications.
	SP	Expanded natural graphite, tanged stainless steel sheet insert (AISI 316; 0.1 mm).		200 / 2900	Material designed for high operating and surface pressures. It has excellent chemical and thermal resistance with blowout safety.	General purpose, steam supply, gas supply, chemical industry, heating systems, high temp. applications.
	EM	Expanded natural graphite, expanded stainless steel sheet insert (AISI 316L; 0.15 mm).		200 / 2900	Material with excellent media resistance and blowout safety, even in applications with cycling loads, makes this material superior.	Steam supply, gas supply, chemical industry, petrochemical industry, heating systems, high temp. applications.
	IQ	Expanded natural graphite (>99% graphite purity) laminated by a special process to an expanded chromium–nickel-steel insert (AISI 316L; 0.15 mm)		200 / 2900	GRAFILIT® IQ is an engineered graphite-based composite material endowed with mechanical reinforcement and anti-stick property making it suitable for high temperature applications. This heavy-duty material has improved surface load resistance (in particular for cycling operations) and blowout resistance.	Automotive and engine building industry, chemical industry, compressors and pumps, gas supply, general purpose, heating systems, paper and cellulose industries, petrochemical industry, power plant, refrigeration and cooling, shipbuilding, steam supply, valves.
Aramid / Graphite sealing materials						
DONIFLEX®	G-LD	Aramid fibres, natural graphite, inorganic fillers, NBR binder.	350 / 662	100 / 1450	Material has very good chemical and thermal resistance. Material's high compressibility enables very good adaptability to uneven flange surfaces.	General purpose, chemical industry, petrochemical industry, paper and cellulose industries, automotive and engine building industry, high temp. applications.
	G-MD	Aramid fibres, natural graphite, inorganic fillers, NBR binder.	350 / 662	100 / 1450	Material has good chemical, thermal, and mechanical properties. It has very good resistance to steam.	Petrochemical industry, paper and cellulose industries, automotive and engine building industry, shipbuilding, heating systems, high temp. applications.
	G-EM	Aramid fibres, natural graphite, inorganic fillers, NBR binder, expanded galvanized steel sheet insert (0.4 mm).	400 / 752	190 / 2755	This material is distinguished by enhanced thermomechanical resistance in particular to surface pressure and blowouts in combination with enhanced sealing characteristics.	Steam supply, petrochemical industry, automotive and engine building industry, power plant, heating systems, high temp. applications.
	C	Reinforced cellulose fibers, inorganic filler bonded with nitrile butadiene rubber binder.	200 / 392	90 / 1305	Doniflex® C is a high density cellulose fiber material, manufactured by the beater addition process under ecological, solvent-free conditions.	General purpose, water supply, paper and cellulose industry, automotive and engine building industry, shipbuilding
Elastomeric sealing materials						
DONIGUM		NBR, SBR, NR, CR, BR, EPDM	depends on product type	depends on product type	various applications for low bolting loads - depends on product type	
PTFE sealing materials						
DONIFLON®	900E	PTFE	260 / 500	100 / 1450	Expanded PTFE material suitable for nearly all media. Not suitable for molten alkali metals and fluorine compounds. Its excellent compressibility enables very good adaptability to pressure sensitive connections like ceramic-, plastic-, glass-lined piping.	Steam supply, chemical industry, petrochemical industry, pharmaceutical industry, food industry, heating systems.
	2010	PTFE, hollow glass microbeads.		60 / 870	Material suitable for nearly all media. Not suitable for molten alkali metals and fluorine compounds. Its high compressibility enables very good adaptability to pressure sensitive connections like ceramic, plastic or glass flanges.	Gas supply, chemical industry, petrochemical industry, pharmaceutical industry, food industry, refrigeration and cooling.
	2020	PTFE, silica.		80 / 1160	Material suitable for nearly all media especially recommended for concentrated inorganic acids. Not suitable for molten alkali metals and fluorine compounds.	General purpose, potable water supply, chemical industry, petrochemical industry, pharmaceutical industry, food industry.
	2030	PTFE, barium sulfate.			Material suitable for nearly all media especially recommended for strong alkalis. Not suitable for molten alkali metals and fluorine compounds.	Potable water supply, steam supply, gas supply, chemical industry, petrochemical industry, pharmaceutical industry.

Temperature and pressure represent maximum values and should not be used simultaneously. They are given only as guidance, since they depend not only on the type of gasket material but also on the assembly conditions. Very important factors are thickness of material, nature of service medium, type of flange and surface pressure. Steam application requires special considerations.

Request for detail product Catalogues

To obtain more information about our products, please do not hesitate to contact us. Any requested product Data Sheets or Catalogues will be sent to you immediately. Our highly skilled group of experts in the technical service department can assist you in solving practically any sealing problem.
If you need our help, please contact us.

SIZE AND CONSTRUCTION - CUSTOM MADE GASKETS

The non-metallic gaskets are produced in several sizes and shapes to meet the most demanding applications. They are available in standard and non-standard gasket design. In terms of non-standard gaskets we can provide any shape and size according to customer design or sample.

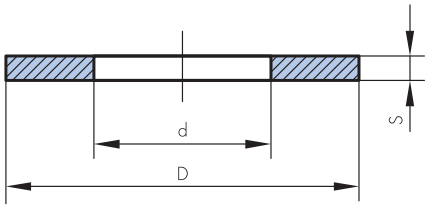
DIMENSIONS

The dimensions of our standard gaskets meet the requirements of the EN 1514-1, ANSI B16.21 or other internationally recognised standards. Gaskets of up to 1500 mm x 1500 mm are made from one piece, while larger ones are assembled from segments. Two kinds of splicing are used: dove-tail and bevelled (there is practically no limitation regarding gasket dimension). In accord with gasket shapes and sizes all other dimensions can be manufactured upon request.

CUTTING CAPABILITIES

With our cutting technology, experience and knowledge we are able to cut almost any material. A wide range of cutting equipment provides competitive pricing and high quality regardless of gasket size or quantity. A large range of presses and special cutting tools together with a CAM-CAD Water Jet and a skilled team are available for the swift production of small quantities. Custom-cut gaskets can be made according to the customers own drawings and specifications, samples and templates. In-house manufactured cutting tools are an integral part of the production unit. There is an extensive catalogue of cutters available.

BA10



Water Jet Cutting

CAM-CAD Water Jet cutter is an excellent system for manufacturing a variety of two-dimensional items both large and small in simple or complex shapes from a wide range of materials. Steel, rubber, aluminium are just a few of the materials that can be cut to the desired shape - drawn, programmed and stored on a CAD-system. The process will leave a smooth finish on steel with no heat affected zones and exceptional two-dimension accuracy.

TOLERANCES

(mm)	up to 600	over 600
d	±0.4	+0
		-3.2
D	±0.4	+0
		-3.2

STANDARDS FOR NON-METALLIC FLAT GASKETS	
Gasket Standard	Flange Standard
EN 1514-1, ASME B16.21	EN 1092-1,-2,-3,-4, ASME B16.5, ASME B16.47

EN 1514-1:1997 & DIN 2690 BA10 IBC gaskets for EN 1092-1 flanges

DN (mm)	d (mm)		D (mm)											
			PN 1 & 2.5		PN 6		PN 10		PN 16		PN 25		PN 40	
	DIN 2690	EN 1514	DIN 2690	EN 1514	DIN 2690	EN 1514	DIN 2690	EN 1514	DIN 2690	EN 1514	DIN 2690	EN 1514	DIN 2690	EN 1514
4	6	-	-	-	-	-	-	-	-	-	30	-	-	-
6	10	-	28	-	28	-	38	-	38	-	38	-	38	-
8	14	-	33	-	33	-	43	-	43	-	43	-	43	-
10	18	18	38	39	38	39	45	46	45	46	45	46	45	46
15	22	22	43	44	43	44	50	51	50	51	50	51	50	51
20	28	27	53	54	53	54	60	61	60	61	60	61	60	61
25	35	34	63	64	63	64	70	71	70	71	70	71	70	71
32	43	43	75	76	75	76	82	82	82	82	82	82	82	82
40	49	49	85	86	85	86	92	92	92	92	92	92	92	92
50	61	61	95	96	95	96	107	107	107	107	107	107	107	107
60	-	72	-	106	-	106	-	117	-	117	-	117	-	117
65	77	77	115	116	115	116	127	127	127	127	127	127	127	127
80	90	89	132	132	132	132	142	142	142	142	142	142	142	142
100	115	115	152	152	152	152	162	162	162	162	168	168	168	168
125	141	141	182	182	182	182	192	192	192	192	195	194	195	194
150	169	169	207	207	207	207	218	218	218	218	225	224	225	224
(175)	195	-	237	-	237	-	248	-	248	-	255	-	267	-
200	220	220	262	262	262	262	273	273	273	273	285	284	292	290
250	274	273	318	317	318	317	328	328	330	329	342	340	353	352
300	325	324	373	373	373	373	378	378	385	384	402	400	418	417
350	368	356	423	423	423	423	438	438	445	444	458	457	475	474
400	420	407	473	473	473	473	490	489	497	495	515	514	547	546
450	470	458	528	528	528	528	540	539	557	555	565	564	572	571
500	520	508	578	578	578	578	595	594	618	617	625	624	628	628
600	620	610	680	679	680	679	695	695	735	734	730	731	745	747
700	720	712	785	784	785	784	810	810	805	804	830	833	850	-
800	820	813	890	890	890	890	915	917	910	911	940	942	970	-
900	920	915	990	990	990	990	1015	1017	1010	1011	1040	1042	1080	-
1000	1020	1016	1090	1090	1090	1090	1120	1124	1125	1128	1150	1154	1190	-
1100	-	1120	-	-	-	-	-	1231	-	1228	-	1254	-	-
1200	1220	1220	1290	1290	1305	1307	1340	1341	1340	1342	1360	1364	1395	-
1400	1420	1420	1490	1490	1520	1524	1545	1548	1540	1542	1575	1578	1615	-
1500	-	1520	-	-	-	-	-	1658	-	1654	-	1688	-	-
1600	1620	1620	1700	1700	1720	1724	1770	1772	1760	1764	1795	1798	1830	-
1800	1820	1820	1900	1900	1930	1931	1970	1972	1960	1964	2000	2000	-	-
2000	2020	2020	2100	2100	2135	2138	2180	2182	2165	2168	2230	2230	-	-
2200	2220	2220	2305	2307	2345	2348	2380	2384	2375	-	-	-	-	-
2400	2420	2420	2505	2507	2555	2558	2590	2594	2585	-	-	-	-	-
2600	2620	2620	2705	2707	2760	2762	2790	2794	2785	-	-	-	-	-
2800	2820	2820	2920	2924	2970	2972	3010	3014	-	-	-	-	-	-
3000	3020	3020	3120	3124	3170	3172	3225	3228	-	-	-	-	-	-
3200	3220	3220	3320	3324	3380	3382	-	-	-	-	-	-	-	-
3400	3420	3420	3520	3524	3590	3592	-	-	-	-	-	-	-	-
3600	3620	3620	3730	3734	3800	3804	-	-	-	-	-	-	-	-
3800	3820	3820	3930	3931	-	-	-	-	-	-	-	-	-	-
4000	4020	4020	4130	4131	-	-	-	-	-	-	-	-	-	-

DN (mm)	PN 63	
	d (mm)	D (mm)
4	-	-
6	-	-
8	-	-
10	18	56
15	21	61
20	25	72
25	30	82
32	41	88
40	47	103
50	59	113
60	68	123
65	73	138
80	86	148
100	110	174
125	135	210
150	163	247
(175)	185	277
200	210	309
250	264	364
300	314	424
350	360	486
400	415	543

ASME B16.21:2011 IBC gaskets for ASME B16.5 pipe flanges and flanged fittings

NPS (in)	d (mm)	D (mm)				
		Class 150	Class 300	Class 400	Class 600	Class 900
1/2	21	48	54	54	54	64
3/4	27	57	67	67	67	70
1	33	67	73	73	73	79
11/4	42	76	83	83	83	89
1 1/2	48	86	95	95	95	98
2	60	105	111	111	111	143
2 1/2	73	124	130	130	130	165
3	89	137	149	149	149	168
3 1/2	102	162	165	162	162	...
4	114	175	181	178	194	206
5	141	197	216	213	241	248
6	168	222	251	248	267	289
8	219	279	308	305	321	359
10	273	340	362	359	400	435
12	324	410	422	419	457	498
14	356	451	486	483	492	521
16	406	514	540	537	565	575
18	457	549	597	594	613	638
20	508	606	654	648	683	699
24	610	718	775	768	791	838

ASME B16.21:2011 IBC gaskets for ASME B16.47 series A large diameter steel flanges

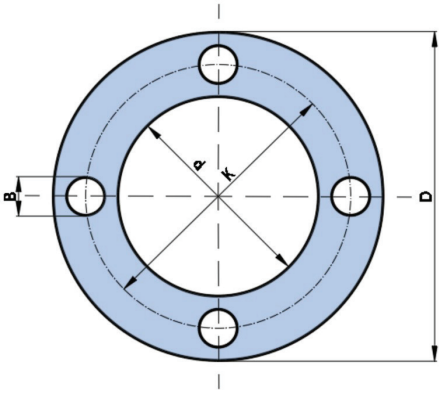
NPS (in)	d (mm)	D (mm)			
		Class 150	Class 300	Class 400	Class 600
26	660	775	835	832	867
28	711	832	899	892	914
30	762	883	953	946	972
32	813	940	1006	1003	1022
34	864	991	1057	1054	1073
36	914	1048	1118	1118	1130
38	965	1111	1054	1073	1105
40	1016	1162	1114	1127	1156
42	1067	1219	1165	1178	1219
44	1118	1276	1219	1232	1270
46	1168	1327	1273	1289	1327
48	1219	1384	1324	1346	1391
50	1270	1435	1378	1403	1448
52	1321	1492	1429	1454	1499
54	1372	1549	1492	1518	1556
56	1422	1607	1543	1568	1613
58	1473	1664	1594	1619	1664
60	1524	1715	1645	1683	1721

ASME B16.21:2011 IBC gaskets for ASME B16.47 series B large diameter steel flanges

NPS (in)	d (mm)	D (mm)				
		Class 75	Class 150	Class 300	Class 400	Class 600
26	660	708	725	772	746	765
28	711	759	776	826	800	819
30	762	810	827	886	857	879
32	813	860	881	940	911	933
34	864	911	935	994	962	997
36	914	973	987	1048	1022	1048
38	965	1024	1045	1099	...	...
40	1016	1075	1095	1149	...	...
42	1067	1126	1146	1200	...	...
44	1118	1181	1197	1251	...	...
46	1168	1232	1256	1318	...	...
48	1219	1283	1307	1368	...	...
50	1270	1334	1357	1419	...	...
52	1321	1387	1408	1470	...	...
54	1372	1438	1464	1530	...	...
56	1422	1495	1514	1594	...	...
58	1473	1546	1580	1656	...	...
60	1524	1597	1630	1705	...	...

ASME B16.21:2011 BA10 FF gaskets for ASME B16.5 pipe flanges and flanged fittings

NPS (in)	Class 150				
	d (mm)	D (mm)	n	B (in)	K (mm)
1/2	21	89	4	5/8	60.3
3/4	27	98	4	5/8	69.9
1	33	108	4	5/8	79.4
1 1/4	42	117	4	5/8	88.9
1 1/2	48	127	4	5/8	98.4
2	60	152	4	3/4	120.7
2 1/2	73	178	4	3/4	139.7
3	89	191	4	3/4	152.4
3 1/2	102	216	8	3/4	177.8
4	114	229	8	3/4	190.5
5	141	254	8	7/8	215.9
6	168	279	8	7/8	241.3
8	219	343	8	7/8	298.5
10	273	406	12	1	362.0
12	324	483	12	1	431.8
14	356	533	12	1 1/8	476.3
16	406	597	16	1 1/8	539.8
18	457	635	16	1 1/4	577.9
20	508	699	20	1 1/4	635.0
24	610	813	20	1 1/8	749.3



EN 1514-1:1997 BA10 FF gaskets for EN 1092-1 flanges

DN (mm)	PN 2.5				
	d (mm)	D (mm)	n	B (mm)	K (mm)
10	18	75	4	11	50
15	22	80	4	11	55
20	27	90	4	11	65
25	34	100	4	11	75
32	43	120	4	14	90
40	49	130	4	14	100
50	61	140	4	14	110
65	77	160	4	14	130
80	89	190	4	18	150
100	115	210	4	18	170
125	141	240	8	18	200
150	169	265	8	18	225
200	220	320	8	18	280
250	273	375	12	18	335
300	324	440	12	22	395
350	356	490	12	22	445
400	407	540	16	22	495
450	458	595	16	22	550
500	508	645	20	22	600
600	610	755	20	26	705

DN (mm)	PN 6				
	d (mm)	D (mm)	n	B (mm)	K (mm)
10	18	75	4	11	50
15	22	80	4	11	55
20	27	90	4	11	65
25	34	100	4	11	75
32	43	120	4	14	90
40	49	130	4	14	100
50	61	140	4	14	110
65	77	160	4	14	130
80	89	190	4	18	150
100	115	210	4	18	170
125	141	240	8	18	200
150	169	265	8	18	225
200	220	320	8	18	280
250	273	375	12	18	335
300	324	440	12	22	395
350	356	490	12	22	445
400	407	540	16	22	495
450	458	595	16	22	550
500	508	645	20	22	600
600	610	755	20	26	705

EN 1514-1:1997 BA10 FF gaskets for EN 1092-1 flanges (continued from previous page)

DN (mm)	PN 10				
	d (mm)	D (mm)	n	B (mm)	K (mm)
10	18	90	4	14	60
15	22	95	4	14	65
20	27	105	4	14	75
25	34	115	4	14	85
32	43	140	4	18	100
40	49	150	4	18	110
50	61	165	4	18	125
65	77	185	8	18	145
80	89	200	8	18	160
100	115	220	8	18	180
125	141	250	8	18	210
150	169	285	8	22	240
200	220	340	8	22	295
250	273	395	12	22	350
300	324	445	12	22	400
350	356	505	16	22	460
400	407	565	16	26	515
450	458	615	20	26	565
500	508	670	20	26	620
600	610	780	20	30	725
700	712	895	24	30	840
800	813	1015	24	33	950
900	915	1115	28	33	1050
1000	1016	1230	28	36	1160
1100	1120	1340	32	39	1270
1200	1220	1455	32	39	1380
1400	1420	1675	36	42	1590
1600	1620	1915	40	48	1820
1800	1820	2115	44	48	2020
2000	2020	2325	48	48	2230

DN (mm)	PN 16				
	d (mm)	D (mm)	n	B (mm)	K (mm)
10	18	90	4	14	60
15	22	95	4	14	65
20	27	105	4	14	75
25	34	115	4	14	85
32	43	140	4	18	100
40	49	150	4	18	110
50	61	165	4	18	125
65	77	185	8	18	145
80	89	200	8	18	160
100	115	220	8	18	180
125	141	250	8	18	210
150	169	285	8	22	240
200	220	340	12	22	295
250	273	405	12	26	355
300	324	460	12	26	410
350	356	520	16	26	470
400	407	580	16	30	525
450	458	640	20	30	585
500	508	715	20	33	650
600	610	840	20	36	770
700	712	910	24	36	840
800	813	1025	24	39	950
900	915	1125	28	39	1050
1000	1016	1255	28	42	1170
1100	1120	1355	32	42	1270
1200	1220	1485	32	48	1390
1400	1420	1685	36	48	1590
1600	1620	1930	40	56	1820
1800	1820	2130	44	56	2020
2000	2020	2345	48	62	2230

DN (mm)	PN 25				
	d (mm)	D (mm)	n	B (mm)	K (mm)
10	18	90	4	14	60
15	22	95	4	14	65
20	27	105	4	14	75
25	34	115	4	14	85
32	43	140	4	18	100
40	49	150	4	18	110
50	61	165	4	18	125
65	77	185	8	18	145
80	89	200	8	18	160
100	115	235	8	22	190
125	141	270	8	26	220
150	169	300	8	26	250
200	220	360	12	26	310
250	273	425	12	30	370
300	324	485	16	30	430
350	356	555	16	33	490
400	407	620	16	36	550
450	458	670	20	36	600
500	508	730	20	36	660
600	610	845	20	39	770
700	712	960	24	42	875
800	813	1085	24	48	990
900	915	1185	28	48	1090
1000	1016	1320	28	56	1210
1100	1120	1420	32	56	1310
1200	1220	1530	32	56	1420
1400	1420	1755	36	62	1640
1600	1620	1975	40	62	1860
1800	1820	2195	44	70	2070
2000	2020	2425	48	70	2300

DN (mm)	PN 40				
	d (mm)	D (mm)	n	B (mm)	K (mm)
10	18	90	4	14	60
15	22	95	4	14	65
20	27	105	4	14	75
25	34	115	4	14	85
32	43	140	4	18	100
40	49	150	4	18	110
50	61	165	4	18	125
65	77	185	8	18	145
80	89	200	8	18	160
100	115	235	8	22	190
125	141	270	8	26	220
150	169	300	8	26	250
200	220	375	12	30	320
250	273	450	12	33	385
300	324	515	16	33	450
350	356	580	16	36	510
400	407	660	16	39	585
450	458	685	20	39	610
500	508	755	20	42	670
600	610	890	20	48	795

GASKET ORDERING EXAMPLE

EN 1514-1, DN 65 / PN 16, Form IBC,
material: TESNIT BA-U, 2 mm

ASME B 16.21, 4" / 300 lbs, Form IBC,
material: TESNIT BA-M, 2 mm

METAL EYELETED FLAT GASKETS

PROPERTIES AND APPLICATIONS

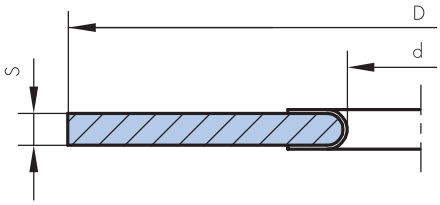
The metal eyeleted flat gaskets offer special protection against blowout for the sealing of critical or dangerous media. The sealing insert is usually made from TESNIT BA or Grafilit gasket material. The standard metal jacket is formed with an austenitic stainless steel leaf with a thickness 0.15 mm - 0.2 mm U-shaped and pressed in such a way that it becomes a single body with a base seal. The good malleability grade of the austenitic stainless steel gives the covering excellent mechanical properties and good resistance to erosion, while the well-known resistance to heat and corrosion ensures a long working life for the seal.

ADVANTAGES

- Blow out protection.
- Protection against chemical attack.
- Improved sealability due to the local higher stress under eyelet.

SHAPE AND CONSTRUCTION

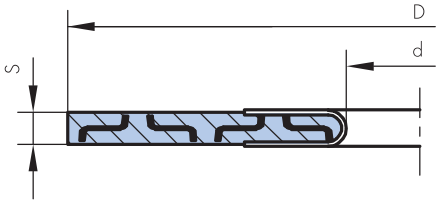
Gaskets are available according to EN 1514-1, ASME B16.21 and other Standard Forms. Custom made gaskets are available upon request.



MP1

SIZE

The only limitation of the eyeleted gasket is the size of the basic gasket material.
Size limitations:
From 20 mm to 400 mm one piece eyelet.
From 400 mm upwards plasma welded eyelet.
The standard production follows the sizes and norms by ASME B16.21 and EN 1514-1.



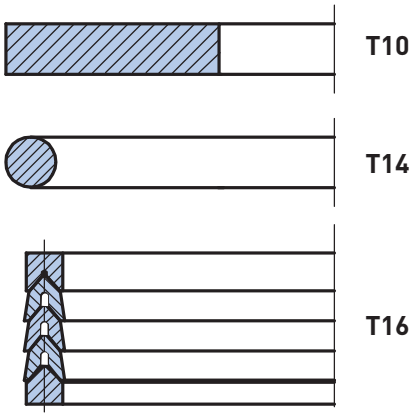
GASKET ORDERING EXAMPLE

EN 1514-1, DN65 / PN 16, Form IBC,
material: TESNIT BA-U, 2 mm, eyelet AISI 316

PROPERTIES AND APPLICATIONS

PTFE gaskets are one of the most suitable types of gaskets for a variety of sealing applications and are mostly based on virgin PTFE or filled PTFE. PTFE gaskets provide an extensive range of applications. PTFE is a fluoropolymer, which features an outstanding chemical resistivity to almost all chemicals, good thermal insulation properties, and useful mechanical and processing characteristics. The above-mentioned PTFE features can be usefully applied in PTFE gaskets. They can be mostly used in valve seats, bearings, requested to resin sliding and chemicals, elastic band for un-lubricated compressors, O-rings where elastomers are not durable. In addition, an extended range of improved mechanical and processing properties can be achieved by combining virgin PTFE with different fillers. Different combinations offer a variety of different properties as described in the following table.

Filler	Improved properties
Glass	• enhanced wear resistance • chemical resistance
Graphite	• extremely low coefficient of friction • fairly good compressive strength • good wear resistance
Carbon	• good thermal resistance • resistance to deformation
Bronze	• enhanced compressive strength • good wear resistance • high thermal conductivity



Expanded PTFE gaskets and seal materials consist of virgin PTFE with multidirectional fibrous and/or porous structure, which the extruded PTFE consists of. A special manufacturing process provides the material with special chemical and physical properties. This can be of advantage in a wide range of applications.

ADVANTAGES

Virgin PTFE, PTFE compounds and expanded PTFE offer a wide range of compounded products with good mechanical properties, electrical properties, thermal properties, chemical resistance, low friction coefficient and good resistance to wear.

SHAPE AND CONSTRUCTION SIZE

Several types of PTFE gaskets are produced to meet the most demanding application.

Materials

Donit is using virgin PTFE powder and compounds for RAM extrusion and compression moulding delivered exclusively by recognised supplier.

SIZE

SIZE limitations: each piece can feature a maximum external diameter of up to 1000 mm.

GASKET ORDERING EXAMPLE

EN 1514-1, DN 65 / PN 16,
Form IBC (virgin PTFE), 2 mm

STANDARDS FOR PTFE GASKETS USED WITH FLANGES	
Gasket standard	**Flange standard**
EN 1514-1	EN 1092-1, -2, -3, -4, EN 545, EN 598, EN 969

PTFE ENVELOPED GASKETS

PROPERTIES AND APPLICATIONS

The sealing insert is made of corrugated stainless steel, soft non-asbestos material, or rubber and different combinations. This insert is coated with PTFE and open on one side, usually on the outer. Thanks to their high chemical stability, good mechanical properties and permanent resistance in the atmosphere (to humidity, gasses, temperature changes) they are suitable for all types of gaskets and different media, mostly for aggressive chemicals.

ADVANTAGES

Benefits from the high stability of C-F bond virgin PTFE, which is used for the envelope and exhibits extraordinary chemical resistance. Combinations of two or more insert materials allow a large number of different applications.

SHAPE AND CONSTRUCTION

The PTFE enveloped gaskets are produced in several types to meet the most demanding applications. Standard shapes are round or oval.
Enveloped material: Virgin PTFE
Base materials: stainless steel, non-asbestos material, rubber ...

SIZE

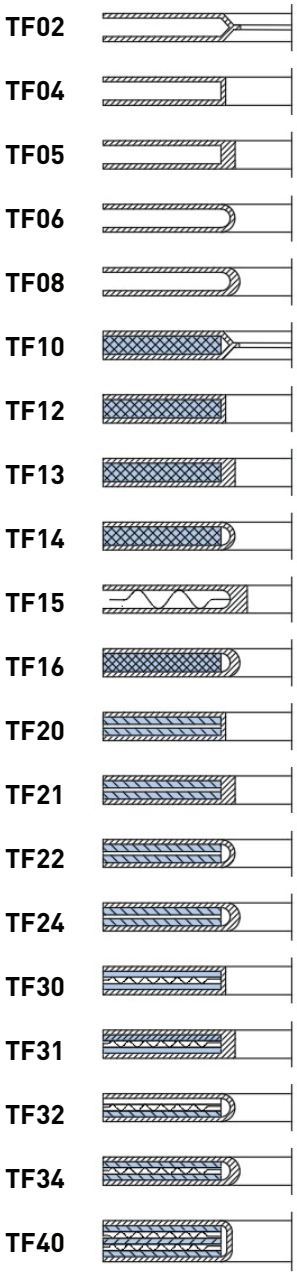
The PTFE envelope for gaskets with maximum external diameter of up to 500 mm are made in one piece, for gaskets with greater diameters they are welded. Oval shapes of PTFE envelopes are welded. There are no limitations regarding sizes for gaskets with welded envelopes.

EN 1514-3:1997 Non-metallic PTFE envelope gaskets

DN (mm)	Gasket inner diameter (mm)	Envelope outer diameter (mm)	Gasket outer diameter (mm)					
	PN Class		PN6	PN 10	PN 16	PN25	PN40	PN63
10	18	36	39	46	46	46	46	56
15	22	40	44	51	51	51	51	61
20	27	50	54	61	61	61	61	72
25	34	60	64	71	71	71	71	82
32	43	70	76	82	82	82	82	88
40	49	80	86	92	92	92	92	103
50	61	92	96	107	107	107	107	113
65	77	110	116	127	127	127	127	138
80	89	126	132	142	142	142	142	148
100	115	151	152	162	162	168	168	174
125	141	178	182	192	192	194	194	210
150	169	206	207	218	218	224	224	247
200	220	260	262	273	273	284	290	309
250	273	314	317	328	329	340	352	364
300	324	365	373	378	384	400	417	424
350	356	412	423	438	444	457	474	486
400	407	469	473	489	495	514	546	543
450	458	528	528	539	555	564	571	
500	508	578	578	594	617	624	628	
600	610	679	679	695	734	731	747	

GASKET ORDERING EXAMPLE

EN 1514-3, Type TF14, DN 65 / PN 16,
material: DONIFLEX G-LD, 2 mm, virgin PTFE



(and combinations)

PROPERTIES AND APPLICATIONS

Donit with its own technology, knowledge and experience is capable of meeting various customer needs. In close co-operation with customers the company develops and produces special types of gaskets for various applications. Gaskets are produced up to a size of 4000 mm in different special types for the most demanding applications in process industry for sealing hot gases.

ADVANTAGES

- Custom made gaskets according to customer specifications.
- Special large single piece gaskets up to 4000 mm in size.
- Unique and strong construction allows easy handling and transport.
- High temperature resistance up to 700 °C (depends on material).
- Capability to compensate for irregularities on flanges.

SHAPE AND CONSTRUCTION

Custom-made gaskets are made to customer's own drawing and specification, samples and templates. A highly skilled hardworking team can provide for almost any customer requirements.

DIMENSION

Up to 4000 mm, according to customers specification.

GASKET ORDERING EXAMPLE

According to customer specification.

PHYSICAL PROPERTIES OF METAL GASKET MATERIALS

AISI / ASTM	Individual name	Material No.	DIN 17006	Hardness HB	Tensile strenght - Rm (N/mm²)	Yield stress - $Rp_{0.2}$ (N/mm²)	Temperature (°C)		Density (g/cm³)
							min.	max.	
FERROUS METALS									
A 570 Gr. 36	Low carbon steel	1.0038	RSt 37-2	100-130	370-450	220	-40	+ 450	7.85
Soft-iron	Soft-iron	1.1003	M2 / Armco	90-110	270-350	190	-60	+ 450	7.85
430	Stainless steel	1.4016	X6Cr17	130-170	450-600	270	-20	+ 350	7.70
304 (304H)	Stainless steel	1.4301	X5CrNi18-10	130-180	500-700	195	-200	+ 425	7.90
304L	Stainless steel	1.4306	X2CrNi19-11	130-170	460-680	180	-270	+ 425	7.90
316	Stainless steel	1.4401	X5CrNiMo17-12-2	130-180	500-670	205	-200	+ 425	7.95
316L	Stainless steel	1.4404	X2CrNiMo17-13-2	120-170	490-690	190	-200	+ 550	7.95
321	Stainless steel	1.4541	X6CrNiTi18-10	130-190	500-730	205	-270	+ 550	7.90
347	Stainless steel	1.4550	X6CrNiNb18-10	130-190	510-740	205	-200	+ 870	7.90
316Ti	Stainless steel	1.4571	X6CrNiMoTi17-12-2	130-190	500-730	215	-270	+ 550	7.98
309	Stainless steel	1.4828	X15CrNiSi20-12	130-220	500-750	230	-110	+ 800	7.90
B408, B409	Incoloy 800	1.4876	X10NiCrAlTi32-20	130-220	500-750	210	-110	+ 850	8.00
NON-FERROUS METALS									
-	Cooper	2.0090	SF-CU	55-65	200-250	90	-270	+ 350	8.94
Brass	Messing Ms 63	2.0321	CuZn 37	60-80	290-370	140	-200	+ 260	8.44
-	Plumbum 99.9	2.3040	Pb 99.9	4	12	-	-250	+ 200	11.50
-	Nickel 99.6	2.4060	Ni 99	100-150	340-400	140	-60	+ 600	8.90
Alloy 200	Nickel 99.2	2.4066	Ni 99.2	100-150	380-450	160	-60	+ 600	8.90
Alloy 400	Monel 400	2.4360	NiCu 30 Fe	100-130	450-580	200	-60	+ 500	8.88
Alloy 600	Inconel 600	2.4816	NiCr 15 Fe	140-200	550-800	200	-60	+ 600	8.42
-	Aluminium 99.5	3.0255	Al 99.5	20-25	70-80	509	-250	+ 300	2.70
-	Aluminium alloy	3.3315	AlMg 1	25-35	90-110	60	-250	+ 300	2.70
B 348 Gr. 1	Titan I	3.7025	71	110-140	290-410	180	-60	+ 300	4.50
B 348 Gr. 2	Titan II	3.7035	71	120-160	390-540	250	-60	+ 350	4.50

The values in the table are given only as guidance, since they depend not only on the type of material but also on the assembly conditions.
Very important factors are type of gasket, nature of service medium, type of flange and surface stress.

PHYSICAL PROPERTIES OF METAL GASKET MATERIALS

	Low-Carbon Steel	Brass	Lead	Copper	Aluminium	Monel	AISI 304, 321	AISI 316, 316Ti
SIMPLE AND COMBINED AROMATIC HYDROCARBONS								
Aniline, $C_6H_5NH_2$								
Citric acid, $C_6H_8O_7\ H_2O$								
Nitrobenzene, $C_6H_5NO_2$								
Toluene, $C_6H_3CH_3$								
OTHER COMPOUNDS AND ORGANIC ELEMETS								
Bromine, Br								
Carbon dioxide, CO_2, dry								
Carbon dioxide, CO_2, wet								
CO, hot								
Glue								
Chlorine, Cl_2, dry								
Chlorine, Cl_2, wet								
Oxygen, O_2, at temp. below 260°C								
Oxygen, O_2, at temp. between 260°C and 535°C								
Oxygen, O_2, at temp. over 535°C								
Creosote								
Oxide, cold								
Ozone, O_3								
Steam, at temp. below 260°C								
Steam, at temp. between 260°C and 535°C								
Steam, at temp. over 535°C								
Gas, lean								
Gas, natural								
Gas, coke gas								
Hydrogen (gas), H_2, cold								
Hydrogen (gas), H_2, hot								
Air								
Mercury, Hg								
Sulphur, S								
Sulphur chloride, S_2Cl_2								
BASES, ACIDS AND INORGANIC SALTS								
Aluminium fluoride, AlF_3								
Aluminium chloride, $AlCl_3$								
Al-sulphate, $Al_2(SO_4)_3$								
Ammonia vapour, NH_3, cold								
Ammonia vapour, NH_3, hot								
Ammonium monobas. phosph.$(NH_4)H_2PO_4$								
Ammonium dibasic phosph.$(NH_4)_2HPO_4$								
Ammonium tribasic phosph.$(NH_4)_3PO_4$								
Ammonium hydroxide, NH_4OH								
Ammonium chloride, NH_4Cl								
Ammonium nitrate, NH_4NO_3								
Ammonium sulphate, $(NH_4)_2SO_4$								
Barium hydroxide, Ba $(OH)_2$								
Barium chloride, $BaCl_2$								
Barium sulphide, BaS								
Borax, $Na_2B_4O_7\ 10H_2O$								
Boric acid, H_3B0_3								
Bromidic acid, HBr								
Hydrocyanic acid, HCN								
Fluosilicic acid								
Phosphoric acid, H_3PO_4, crude								
Alum, KCr $(SO_4)_2\ 12H_2O$								
Calcium bisulphite, Ca $(HSO_3)_2$								
Calcium hydroxide, Ca $(OH)_2$								
Calcium hypochlorite, $CaOCl_2\ 4H_2O$								
Calcium chlorite, $CaCl_2$								
Chromic acid, $H_2\ CrO_4$								
Carbon bisulphide, CS_2								
Hydrochloric acid, HCl, below 65°C								
Hydrochloric acid, HCl, over 65°C								
Iron chloride, $FeCl_3$								
Iron sulphate, $Fe_2(SO_4)_3$								
FUELS, FLUIDS, LUBRICANTS								
Asphalt								
Petrol, with sulph. compounds								
Petrol, refined								
Benzoline								
Cellulose paints and solvents								
Ether, $C_2H_5OC_2H_5$								
Vinegar, CH_3COOH, 5%								
Milk								
Naphta								
Fuel oil								
Linseed oil								
Lubricant oil, unrefined								
Lubricant oil, refined								
Mineral oil								
Castor oil								
Crude oil, at temp. below 260°C								
Crude oil, at temp. between 260°C and 535°C								
Crude oil, at temp. over 535°C								
Tar								
Turpentine								
Water, H_2O distilled								
Sea water, H_2O								
Mineral water, H_2O with oxidizingsalts								
Mineral water, H_2O without oxidizing salts								
Drinking water, H_2O								

	Low-Carbon Steel	Brass	Lead	Copper	Aluminium	Monel	AISI 304, 321	AISI 316, 316Ti
ALCOHOLS, ETHERS, ACIDS, ESTERS, ANHYDRIDES AND KETONES								
Acetone, CH_3COOH_3								
Amyl acetate, $CH_3COOC_5H_{10}$								
Amyl alcohol, $C_5H_{11}OH$								
Acetic anhydride, $(CH_3CO)_2O$								
Cupric chloride, $CuCl_2$								
Cupric sulphate, $CuSO_4$								
Butyl alcohol, C_4H_9OH								
Butyl acetate, $CH_3COOC_4H_9$								
Zinc chloride, $ZnCl_2$								
Zinc sulphate, $ZnSO_4$								
Nitric acid, HNO_3, crude								
Nitric acid, HNO_3, diluted								
Nitric acid, HNO_3, concentrated								
Ethyl acetate, $CH_3COOC_2H_5$								
Ethyl cellulose								
Ethylene chloride, $(CH_2Cl)_2$								
Ethylene glycol, $(CH_2OH)_2$								
Phenol, C_6H_5OH								
Formaldehyde, HCHO								
Phosphoric acid, H_3PO_4								
- with concentr. below 45%								
- cold, concentr. over 45%								
- hot, concentr. over 45%								
Hydrofluoric acid, HF								
- cold, concentr. below 65%								
- cold, concentr. over 65%								
- hot, concentr. below 65%								
- hot, concentr. over 65%								
Glycerine, $C_3H_5\ (OH)_3$								
Glucose								
Potash, K								
Potassium cyanide, KCN								
Potassium chloride, KCl								
Potassium sulphate, K_2SO_4								
Stannic chloride, $SnCl_2$								
Chloroacetic acid, $CH_2ClCOOH$								
Cresylic acid								
Magnesium hydroxide, $Mg(OH)_2$								
Magnesium chloride, $MgCl_2$								
Magnesium sulphate, $MgSO_4$								
Methyl alcohol, CH_3OH								
Sodium cyanide, NaCN								
Sodium phosphate, $Na_3PO_412H_2O$, monobasic								
Sodium phosphate, Na_2HPO_4, dibasic								
Sodium phosphate, NaH_2PO_4, tribasic								
Sodium hydroxide, NaOH								
Sodium hypochlorite, NaOCl								
Sodium carbonate, Na_2CO_3								
Sodium chloride, NaCl								
Sodium metaphosphate, $NaPO_3$								
Sodium nitrate, $NaNO_3$								
Sodium perborate, $NaBO_3\ 4H_2O$								
Sodium peroxide, Na_2O_2								
Sodium silicate, $Na_2SiO_3K_2SiO_3$								
Sodium sulphate, Na_2SO_4								
Sodium sulphite, Na_2SO_3								
Sodium thiosulphate, $Na_2S_2O_3$								
Nickel sulphate, $NiSO_4$								
SIMPLE AND COMBINED ALIPHATIC HYDROCARBONS								
Acetylene, C_2H_2								
Butane, C_4H_{10}								
Freon, $CHClF_2$								
Methyl chloride, CH_2Cl_2								
Lactic acid, $CH_3CHOHCOOH$, cold								
Lactic acid, $CH_3CHOHCOOH$, hot								
Fornic acid, HCOOH								
Acetic acid, CH_3COOH, unrefined								
Acetic acid, CH_3COOH, pure								
Acetic acid, CH_3COOH, vapour								
Acetic acid, CH_3COOH at 10 bar and 200°C								
Oxalic acid, $(COOH)_2$								
Oleic acid, $C_{17}H_{33}COOH$								
Palmitic acid, $C_{15}H_{31}COOH$								
Molten picric acid, $(NO_2)C_6H_2OH$								
Aqueous solution of picric acid $(NO_2)C_6H_2OH$								
Propane, C_3H_8								
Stearic acid, $C_{17}H_{35}COOH$								
Carbon tetrachloride, CCl_4								
Solvents based on chlorine, dry								
Solvents based on chlorine, wet								
Trichloroethylene, C_2HCl_3								
Nickel chloride, $NiCl_2$								
Sodium bicarbonate, Na_2CO_3								
Hydrogen peroxide, H_2O_2								
Mercury chloride, $HgCl_2$								
Sulphurous acid, H_2SO_3								
Sulphuric acid, H_2SO_4								
- cold, with concentr. up to 10%								
- hot, with concentr. up to 10%								
- cold, concentr. 10-75%								
- hot, concentr. 10-75%								
- cold, concentr. 75-95%								
- hot, concentr. 75-95%								
- steam concentr. 75-95%								
Hydrogen sulphide, H_2S, dry, cold								
Hydrogen sulphide, H_2S, dry, hot								
Hydrogen sulphide, H_2S, wet, cold								
Hydrogen sulphide, H_2S, wet, hot								

recommended

recommendation depends on operating conditions

not recommended

Chemical resistance chart for Tesnit products

The recommendations made here are intended as a guideline for the selection of a suitable gasket. The function and durability of these products depends upon a number of factors.

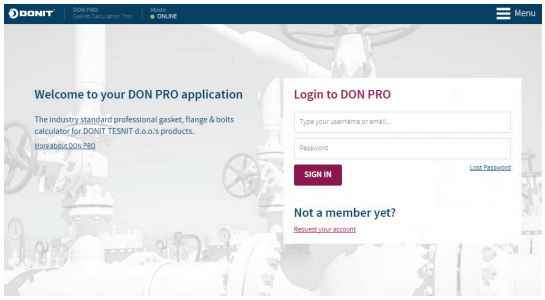
+ Recommended
? Recommendation depends on operating conditions
- Not recommended

	BA-202	BA-203, BA-50, BA-55, BA-U, BA-M, BA-GL	BA-CF	BA-R, BA-REM, BA-R300, BA-R302
Acetamide	+	+	+	+
Acetic acid, 10%	+	+	+	-
Acetic acid, 100% (Glacial)	?	-	?	-
Acetone	?	?	?	?
Acetonitrile	-	-	-	-
Acetylene (gas)	+	+	+	+
Acid chlorides	-	-	-	-
Acrylic acid	-	?	?	-
Acrylonitrile	-	-	-	-
Adipic acid	+	+	+	-
Air (gas)	+	+	+	+
Alcohols	+	+	+	+
Aldehydes	?	?	?	?
Alum	+	+	+	?
Aluminium acetate	?	+	+	-
Aluminium chlorate	?	?	?	-
Aluminium chloride	-	?	?	-
Aluminium sulfate	-	?	?	-
Amines	-	-	-	-
Ammonia (gas)	-	?	?	?
Ammonium bicarbonate	+	+	+	+
Ammonium chloride	+	+	+	-
Ammonium hydroxide	?	+	+	+
Amyl acetate	?	?	?	?
Anhydrides	-	?	?	-
Aniline	-	-	-	-
Anisole	?	?	?	?
Argon (gas)	+	+	+	+
Asphalt	+	+	+	+
Barium chloride	+	+	+	-
Benzaldehyde	-	-	-	-
Benzene	+	+	+	+
Benzoic acid	?	?	?	?
Bio-diesel	+	+	+	+
Bio-ethanol	+	+	+	+
Black liquor	?	?	?	-
Borax	+	+	+	+
Boric acid	+	+	+	-
Butadiene (gas)	+	+	+	+
Butane (gas)	+	+	+	+
Butyl alcohol (Butanol)	+	+	+	+
Butyric acid	?	+	+	-
Calcium chloride	+	+	+	-
Calcium hydroxide	+	+	+	+
Carbon dioxide (gas)	+	+	+	+
Carbon monoxide (gas)	+	+	+	+
Cellosolve	?	?	?	?
Chlorine (gas)	-	-	-	-
Chlorine (in water)	-	-	-	-
Chlorobenzene	?	?	?	?
Chloroform	-	-	-	-
Chloroprene	?	?	?	?
Chlorosilanes	-	-	-	-
Chromic acid	-	-	-	-
Citric acid	?	?	?	-
Copper acetate	+	+	+	-
Copper sulfate	+	+	+	-
Creosote	?	?	?	?
Cresols (Cresylic acid)	-	-	-	-
Cyclohexane	+	+	+	+
Cyclohexanol	+	+	+	+
Cyclohexanone	?	?	?	?
Decalin	+	+	+	+
Dextrin	+	+	+	+
Dibenzyl ether	?	?	?	?
Dibutyl phthalate	?	?	?	?
Dimethylacetamide (DMA)	?	?	?	?
Dimethylformamide (DMF)	?	?	?	?
Dioxane	-	-	-	-

	BA-202	BA-203, BA-50, BA-55, BA-U, BA-M, BA-GL	BA-CF	BA-R, BA-REM, BA-R300, BA-R302
Diphyl (Dowtherm A)	+	+	+	+
Esters	?	?	?	?
Ethane (gas)	+	+	+	+
Ethers	?	?	?	?
Ethyl acetate	?	?	?	?
Ethyl alcohol (Ethanol)	+	+	+	+
Ethyl cellulose	?	?	?	?
Ethyl chloride (gas)	-	-	-	-
Ethylene (gas)	+	+	+	+
Ethylene glycol	+	+	+	+
Formaldehyde (Formalin)	?	?	?	?
Formamide	?	?	?	?
Formic acid, 10%	?	+	+	-
Formic acid, 85%	-	?	?	-
Formic acid, 100%	-	-	-	-
Freon-12 (R-12)	+	+	+	+
Freon-134a (R-134a)	+	+	+	+
Freon-22 (R-22)	?	?	?	?
Fruit juices	+	+	+	-
Fuel oil	+	+	+	+
Gasoline	+	+	+	+
Gelatin	+	+	+	+
Glycerine (Glycerol)	+	+	+	+
Glycols	+	+	+	+
Helium (gas)	+	+	+	+
Heptane	+	+	+	+
Hydraulic oil (Glycol based)	+	+	+	+
Hydraulic oil (Mineral type)	+	+	+	+
Hydraulic oil (Phosphate ester based)	?	?	?	?
Hydrazine	-	-	-	-
Hydrocarbons	+	+	+	+
Hydrochloric acid, 10%	-	?	?	-
Hydrochloric acid, 37%	-	-	-	-
Hydrofluoric acid, 10%	-	-	-	-
Hydrofluoric acid, 48%	-	-	-	-
Hydrogen (gas)	+	+	+	+
Iron sulfate	+	+	+	-
Isobutane (gas)	+	+	+	+
Isooctane	+	+	+	+
Isoprene	+	+	+	+
Isopropyl alcohol (Isopropanol)	+	+	+	+
Kerosene	+	+	+	+
Ketones	?	?	?	?
Lactic acid	?	?	?	-
Lead acetate	?	+	+	-
Lead arsenate	+	+	+	-
Magnesium sulfate	+	+	+	+
Maleic acid	?	?	?	-
Malic acid	?	?	?	-
Methane (gas)	+	+	+	+
Methyl alcohol (Methanol)	+	+	+	+
Methyl chloride (gas)	?	?	?	?
Methylene dichloride	?	?	?	?
Methyl ethyl ketone (MEK)	?	?	?	?
N-Methyl-pyrrolidone (NMP)	?	?	?	?
Milk	+	+	+	+
Mineral oil (ASTM no.1)	+	+	+	+
Motor oil	+	+	+	+
Naphtha	+	+	+	+
Nitric acid, 10%	-	-	-	-
Nitric acid, 65%	-	-	-	-
Nitrobenzene	-	-	-	-
Nitrogen (gas)	+	+	+	+
Nitrous gases (NOx)	?	?	?	-
Octane	+	+	+	+
Oils (Essential)	+	+	+	+
Oils (Vegetable)	+	+	+	+
Oleic acid	+	+	+	-
Oleum (Sulfuric acid, fuming)	-	-	-	-

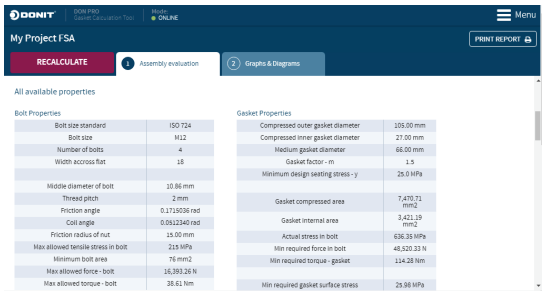
	BA-202	BA-203, BA-50, BA-55, BA-U, BA-M, BA-GL	BA-CF	BA-R, BA-REM, BA-R300, BA-R302
Oxalic acid	?	?	?	-
Oxygen (gas)	-	?	-	-
Palmitic acid	+	+	+	-
Paraffin oil	+	+	+	+
Pentane	+	+	+	+
Perchloroethylene	-	-	-	-
Petroleum (Crude oil)	+	+	+	+
Phenol (Carbolic acid)	-	-	-	-
Phosphoric acid, 40%	-	?	?	-
Phosphoric acid, 85%	-	-	-	-
Phthalic acid	+	+	+	-
Potassium acetate	+	+	+	-
Potassium bicarbonate	+	+	+	+
Potassium carbonate	+	+	+	+
Potassium chloride	+	+	+	-
Potassium cyanide	+	+	+	-
Potassium dichromate	-	?	?	-
Potassium hydroxide	-	?	?	?
Potassium iodide	+	+	+	-
Potassium nitrate	+	+	+	-
Potassium permanganate	-	?	?	-
Propane (gas)	+	+	+	+
Propylene (gas)	+	+	+	+
Pyridine	-	-	-	-
Salicylic acid	?	?	?	-
Seawater/brine	+	+	+	-
Silicones (oil/grease)	+	+	+	+
Soaps	+	+	+	+
Sodium aluminate	?	+	+	+
Sodium bicarbonate	+	+	+	+
Sodium bisulfite	?	+	+	-
Sodium carbonate	+	+	+	+
Sodium chloride	+	+	+	-
Sodium cyanide	+	+	+	-
Sodium hydroxide	-	?	?	?
Sodium hypochlorite (Bleach)	-	?	?	-
Sodium silicate (Water glass)	+	+	+	?
Sodium sulfate	+	+	+	+
Sodium sulfide	-	+	+	-
Starch	+	+	+	+
Steam	?	+	+	?
Stearic acid	+	+	+	-
Styrene	?	?	?	?
Sugars	+	+	+	+
Sulfur	?	?	?	?
Sulfur dioxide (gas)	?	?	?	?
Sulfuric acid, 20%	-	-	-	-
Sulfuric acid, 98%	-	-	-	-
Sulfuryl chloride	-	-	-	-
Tar	+	+	+	+
Tartaric acid	?	?	?	-
Tetrahydrofuran (THF)	-	-	-	-
Titanium tetrachloride	-	-	-	-
Toluene	+	+	+	+
2,4-Toluenediisocyanate	?	?	?	?
Transformer oil (Mineral type)	+	+	+	+
Trichloroethylene	-	-	-	-
Vinegar	+	+	+	-
Vinyl chloride (gas)	-	-	-	-
Vinylidene chloride	-	-	-	-
Water	+	+	+	?
White spirits	+	+	+	+
Xylenes	+	+	+	+
Xylenol	-	-	-	-
Zinc sulfate	+	+	+	-

HOW TO SELECT AN INDUSTRIAL GASKET?



For any gasket application the choice of gasket material will depend on the operating conditions, mechanical features of the flanged assembly, the gasket characteristics and dimensions. In general, operating conditions determine the choice of jointing material, whereas the dimensional and mechanical features of the flange define the gasket type. The performance of any jointing material is influenced by the temperature, internal pressure, fluid, bolts (compressive stress), flange (type of flange, flange surface finish ...), cost-effectiveness and other special considerations.

DON PRO®



The DON PRO® software represents a successful tool for proper choice of gasket materials and gaskets connected with major sealing problems of the static sealing area. The software includes a large number of flange and bolts dimensions according to different standards. The influence of internal pressure and temperature of the media on the gasket and bolts are checked as well as the chemical resistance of the gasket material against the media. Another possibility offered by the software is the optimization of the joint regarding the type of the selected sealing material or the gasket thickness.

CONSULTING AND SUPPORT

Bespoke gasket calculation software DON PRO® takes into account all of the gasket selection factors connected to the major sealing problems of static sealing areas and enables us to make the perfect recommendation:

- calculations take into account the influence of internal pressure and temperature on the gasket and bolts,
- calculations about the chemical resistance of the gasket material,
- optimizations of the joint regarding the type of selected sealant material and/or the gasket thickness.

HOW TO INSTALL AND USE GASKETS IN THE FIELD?

Successful sealing of a flanged connection depends upon many elements of a well-designed flanged system working well together. Here is a summary, which should serve as a guideline for maintenance operators, engineers, and fitters in order to ensure successful gasket installation and assembly of bolted flange connections.

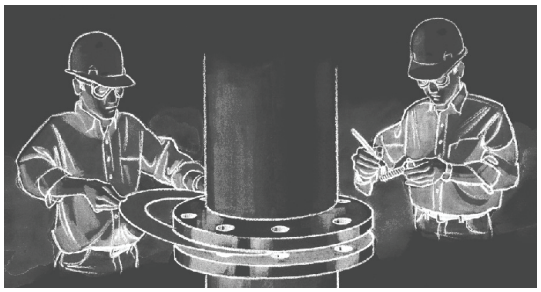
TOOLS REQUIRED

Special tools are required for cleaning and tensioning the fasteners. In addition, always use standard safety equipment and follow good safety practice. Prepare the following equipment prior to installation:

- calibrated torque wrench, hydraulic or other tensioner,
- wire brush,
- lubricant,
- helmet and safety goggles,
- other plant-specified equipment.

1. Clean and examine

Remove all particles and debris from seating surfaces, fasteners (bolds or studs), nuts, and washers. Use plant-specified dust control procedures. Examine fasteners (bolds or studs), nuts, and washers for defects such as burrs or cracks. Examine flange surfaces for warping, radial scores, heavy tool marks, or anything prohibiting proper gasket seating. Replace components if found to be defective.



2. Align flanges

Align flange faces and bolt holes without using excessive force. Report any misalignment.

3. Install gasket

Verify if the gasket is of the specified size and material. Carefully insert gaskets between the flanges. Make sure the gasket is centred between the flanges. Do not use "jointing compounds", graphite, grease or release agents on the gasket or seating surfaces. Bring flanges together, ensuring the gasket isn't pinched or damaged.

4. Lubricate load-bearing surfaces

Use only specified or approved lubricants. Liberally apply lubricant uniformly to all thread, nut, and washer load-bearing surfaces. Ensure lubricant doesn't contaminate either flange or gasket face.

5. Install and tighten bolts

Always use proper tools: calibrated torque wrench or other controlled-tensioning device.
Consult our Technical expert or use the Gasket calculation software DON for guidance on torque specification.
Always torque nuts in a cross bolt-tightening pattern. Tighten the nuts in multiple steps:

step-1 Tighten all nuts initially by hand. (Larger bolts may require a small hand wrench.)
step-2 Torque each nut to approximately 40% of full torque.
step-3 Torque the nuts to approximately 70% of full torque.
step-4 Torque each nut to full torque, again using the cross bolt-tightening pattern. (Large-diameter flanges may require additional tightening passes.)
step-5 Apply at least one final full torque to all nuts in a clock-wise direction until all torque is uniform. (Large-diameter flanges may require additional tightening passes.)

6. Retightening

Do not retorque elastomer-based, asbestos free gaskets after they have been exposed to elevated temperatures unless otherwise specified. Retorque fasteners exposed to aggressive thermal cycling. All retorquing should be performed at ambient temperature and atmospheric pressure.

STORING GASKETS

Industrial gaskets consist of various materials, which are subjected to ageing, weathering, oxidation ... Ageing causes decreasing of the mechanical properties of gaskets. For this reason storage under the following conditions is recommended:

- ambient temperature of storage - move away from heaters,
- dark storage room - move away from direct sunlight,
- dry atmosphere,
- avoid areas where electric discharge appears - ozone production,
- gaskets must lie horizontally - avoid hanging on hooks or folding which could cause cracking.

Avoid storing gaskets for more than two years.

CUSTOMERS SERVICE - TECHNICAL SUPPORT

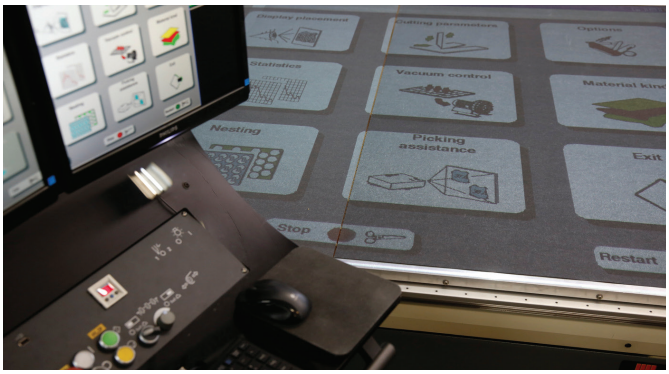
Our team is always available to our customers for any assistance they might need, including advice on the selection and use of our sealing products. This is provided by a special team of highly skilled experts making up the Application Engineering department. By passing on their comprehensive knowledge of our products, the Application Engineering experts can help you solve practically any sealing problem. If you need our help or advice, please do not hesitate to contact us.

24h service

Sometimes sealing problems require an instant solution. If that happens, we are there for you. A quick response to our customers' needs is an integral part of our customer centric approach. We are proud to offer a 24 hour service for our approved products.
The 24 hour service is achieved through maintaining an extensive inventory of approved sealing products. This enables our customers to meet their ambitious time-to-market needs, lower cost targets and to stop any leaks.

How does it work?

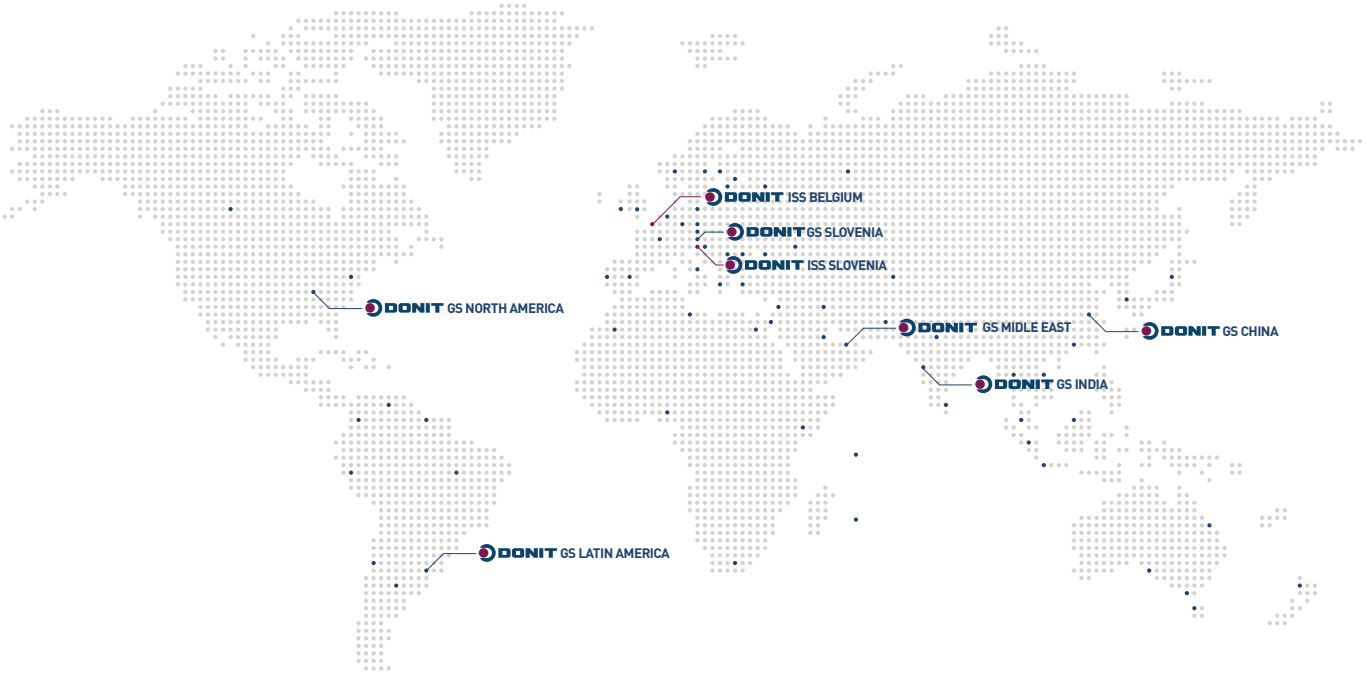
Our customers are able to choose their desired sealing product with the help of our solutions team. The chosen products can then be collected the following day. For more information ask your dedicated sales person.



Quality production

We assure fast supply and top quality gaskets as per your wishes and needs, using engineering and the best suitable production process.

MADE IN THE EU WITH A PRESENCE IN MORE THAN 65 COUNTRIES SUPPLYING CONSISTENT QUALITY TO THE WORLD.



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DISCLAIMER

All information data quoted are based on decades of experience in production and operation of sealing elements. However, in view of the wide variety of possible installation and operating conditions one cannot draw final conclusions in all application cases regarding the behaviour in a gasket joint. The data may not, therefore, be used to support any warranty claims. Whenever there is any doubt, our experts will be pleased to assist you finding the optimum sealing solution.

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