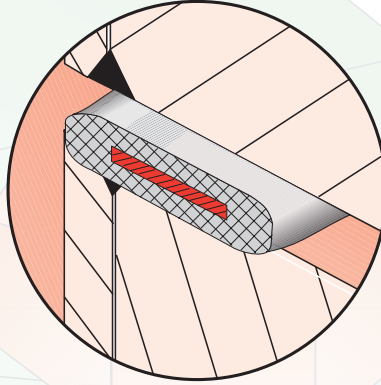


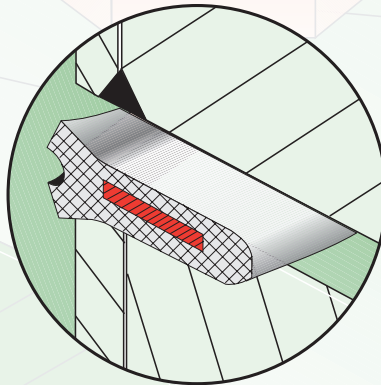


# ***kempochen***

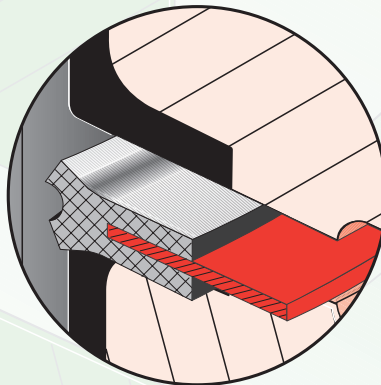
*the right choice!*



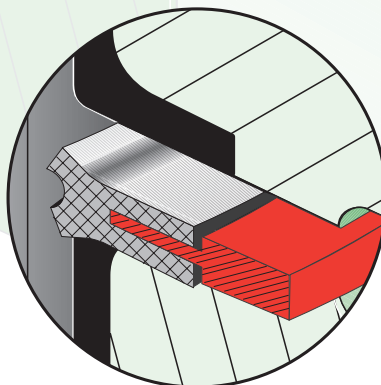
**Profile WG**



**Profile WG2**



**Profile WS**



**Profile WL**

**Rubber-Steel Gaskets**



Kempchen & Co. GmbH  
Alleestrasse 4  
D-46049 Oberhausen  
Tel. ++49 208 8482-0  
Fax ++49 208 8482-285  
E-mail: info@kempchen.de

## WHO WE ARE

At the age of 23 Heinrich Kempchen founded his company as a one-man business in 1889. One of the leading companies in the field of gasket technology has developed from this in the course of the decades. The body of permanent staff today includes approx. 500 employees in the plant in Oberhausen.

In order to take the increased demands of our customers for service and readiness to deliver into consideration, Kempchen & Co GmbH has consistently expanded its raw material and finished goods stock in the last few years. Thus the majority of standard gaskets are available to our customers in the shortest time possible.

Our decades of experience in the field of gasket engineering, as well as modern and optimised production technologies, are a guarantee for the consistently high standard of our products. This has been underlined by the Technical Control Board of RWTÜV with its certification according to EN ISO 9001.



Both advice and problem-solving with regard to your sealing components - supported by our own research and development department - are on offer to you as early as the structural design phase. The comprehensive and demanding tasks of our customers are solved by our consultant engineers within the framework of a service order. Consult our gasket calculation service.

**kempchen**  
*the right choice!*

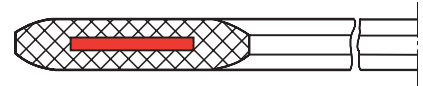
# Rubber-Steel Gaskets

Rubber-steel gaskets have secured a fixed application range in the world of gasket technology. Wherever safe sealing of media with an extremely low leakage rates and low joint loads at relatively low temperatures is required, rubber-steel gaskets provide the best possible solution.

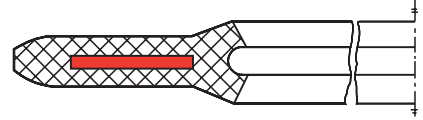
The different steel supporting rings cause increasing pressure stability and enable trouble-free handling of the rubber-steel gaskets - even under the most difficult assembly conditions.

As a result of its very good adaptability to the sealing surfaces, rubber as a sealing material give you an opportunity of sealing safely even in rough service conditions.

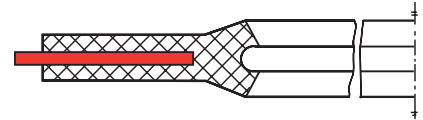
Ask our engineering consultancy service or our in-site field sales staff about the best possible rubber-steel gasket for your operating conditions. Make use of our experience in gasket technology which we have gathered in more than one hundred years.



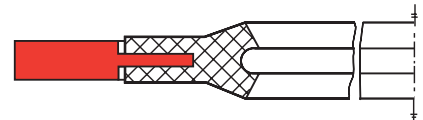
**Profile WG**  
Page 4



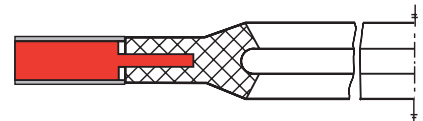
**Profile WG2**  
Page 5



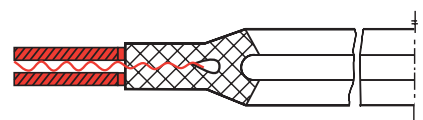
**Profile WS**  
Page 6



**Profile WL**  
Page 8



**Profile WL-HT**  
Page 9

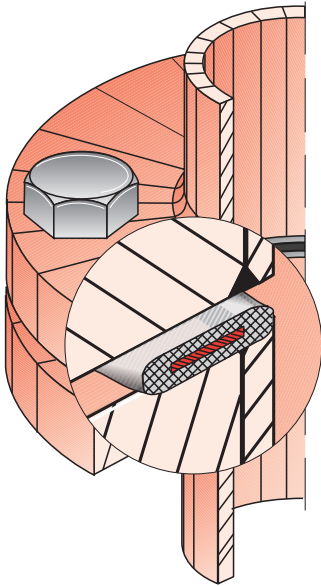
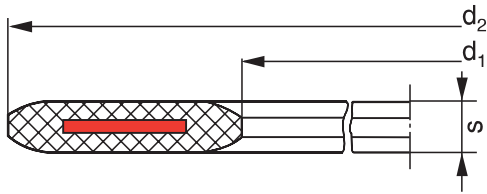


**Profile WL2**  
Page 10

**Rubber qualities for rubber-steel gaskets**  
Page 11

**Note on the calculation of the bolting load for WG, WG2 WS for WL, WL-HT, WL2**  
Page 11

**Gasket parameters**  
Page 10 + 11



**Profile WG  
According to DIN 2690 (PN 1 to  
PN 40)**

Example order:  
Profile WG, quality NR, DN 300, PN 10, DIN 2690

Dimensions in mm

DN	$d_1$	$d_2$					s
		PN6	PN10	PN16	PN25	PN40	
15	22	-	50	50	50	50	3
20	28	-	60	60	60	60	3
25	35	-	70	70	70	70	3
32	43	-	82	82	82	82	3
40	49	-	92	92	92	92	3
50	61	-	107	107	107	107	4
65	77	-	127	127	127	127	4
80	90	-	142	142	142	142	4
100	115	-	162	162	168	168	5
125	141	-	192	192	-	-	5
150	169	-	218	218	225	225	5
175	195	-	248	248	-	-	5
200	220	-	273	273	285	-	6
250	274	-	328	330	342	-	6
300	325	-	378	385	402	-	6
350	368	423	438	445	458	-	7
400	420	473	490	497	515	-	7
450	470	-	540	-	-	-	7
500	520	578	595	618	-	-	7
600	620	-	695	735	-	-	7
700	720	785	810	-	-	-	8
800	820	890	915	910	-	-	8
900	920	-	1015	1010	-	-	8
1000	1020	-	1120	1125	-	-	8
1200	1220	-	1340	1340	-	-	8
1400	1420	-	1545	-	-	-	8
1600	1620	-	1770	-	-	-	8
1800	1820	-	1970	-	-	-	8

**Rubber-Steel Gasket  
PROFILE WG**

- Main load gasket -

The WG profile rubber-steel gasket consists of a carbon-steel ring which is completely enclosed in rubber. Thus the steel ring is protected against corrosion and media. As a result of the vulcanisation high adhesion is guaranteed between the rubber and the steel ring.

**Special features:**

- High reliability against pressing or pushing out because of the steel reinforcement
- Simple, safe and cost-effective gasket assembly compared with non-reinforced rubber gaskets due to the dimensional stability
- Extremely low leakage rate as a result of the homogeneous rubber coating, therefore particularly suitable for pipeline systems with environmentally endangering media
- Low demands made on the flange surfaces due to the soft, adaptable sealing surface, sealing is even possible with slightly damaged flanges
- Depending on diameter usable up to approx. 25 bar with a tightening surface pressure of 2 N/mm<sup>2</sup> up to max. 15 N/mm<sup>2</sup>

**Typical applications:**

- Gas and drinking water supplies
- Chemical industry - both with aggressive and environmentally endangering media
- Flue gas purification plants and cooling circuits in power plants
- Sewage networks
- Pipeline construction with vacuum-operated pipelines as well as pipeline systems with fully rubberised or enamelled flange sealing surfaces
- Enamelled pipeline and apparatus flange connection.

**WG profile rubber-steel gaskets  
are supplied from stock.  
On request we will quote the available  
materials and sizes.**

# Rubber-Steel Gasket PROFILE WG2

- Main load gasket -

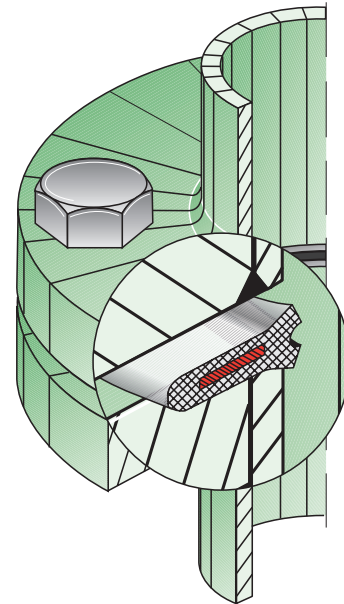
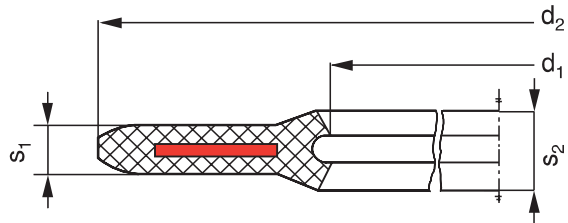
The WG2 profile rubber-steel gasket is a further development of the WG profile rubber-steel gasket. On the inner diameter it has two stable sealing lips and on the outer diameter the shape of the WG profile rubber-steel gasket.

**Special features:**

- Reliable tightness even with the slightest fastening torque, therefore the WG2 profile rubber-steel gasket is particularly suitable for flanged joints made of plastics, to which high forces should not apply
- Greater tightness as a result of the self-sealing effect of the sealing lips with internal pressure load
- No overstressing or creeping of the flexible sealing lips compared to rubber-steel gaskets with solid profile extension such as an O-ring or tapered ring
- Optimal compensation of flange irregularities as a result of the flexible sealing lips, particularly if all-over sealing cannot always be guaranteed as with glass-fibre reinforced flanges
- Certain compensation of smaller flange distortions
- Depending on diameter usable up to approx. 25 bar with a tightening surface pressure of 2 N/mm<sup>2</sup> up to max. 15 N/mm<sup>2</sup>

**Typical applications:**

- Plastic and glass-fibre reinforced flange joints
- Sealing vacuum-operated pipeline systems in the chemical industry
- Gas and drinking water supplies
- Sealing torsionally soft flanges



**Profile WG2  
According to DIN 2690 (PN 10 to  
PN 40)**

*Example order:*

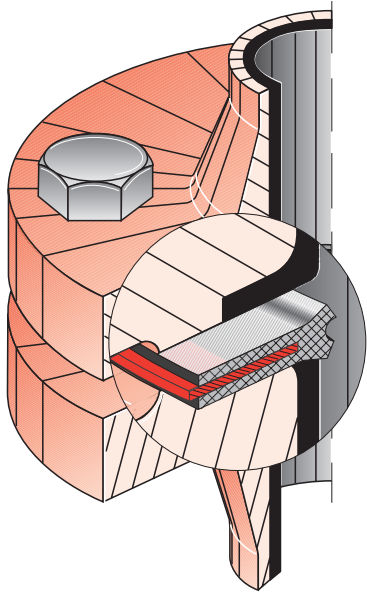
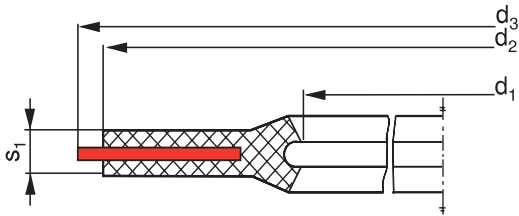
Profile WG2, quality NR, DN 300, PN 10, DIN 2690

Dimensions in mm

DN	d <sub>1</sub>	d <sub>2</sub>				s <sub>1</sub>	s <sub>2</sub>
		PN 10	PN 16	PN 25	PN 40		
25	35	70	70	70	70	4	6
32	43	82	82	82	82	4	6
40	49	92	92	92	92	4	6
50	61	107	107	107	107	4	6
65	77	127	127	127	127	4	6
80	90	142	142	142	142	4	6
100	115	162	162	168	168	5	7,5
125	141	192	192	-	-	5	7,5
150	169	218	218	225	225	5	7,5
175	195	248	248	-	-	5	7,5
200	220	273	273	285	292	6	9
250	274	328	330	342	353	6	9
300	325	378	385	402	418	6	9
350	368	438	445	-	-	7	11
400	420	490	-	-	-	7	11
450	470	540	-	-	-	7	11
500	520	595	-	-	-	7	11
600	620	695	735	-	-	7	11
700	720	810	-	-	-	8	12

Further dimensions on request

**WG2 profile rubber-steel gaskets  
are supplied from stock.  
On request we will quote the available  
materials and sizes.**



**Works standard 183  
for ANSI/ASME B 16.5 flanges  
(class 150 lbs to class 300 lbs)**

Example order:

Profile WS, NBR/1.4541, NPS 1", class 150 lbs,  
works standard 183

Dimensions in mm

NPS	$d_1$	$d_2$	$d_3$		$s_1$
			class 150	class 300	
1/2"	18	45	45	51	4
3/4"	22	50	54	64	4
1"	28	60	64	70	4
1 1/4"	35	70	73	82	4
1 1/2"	43	82	83	93	4
2"	61	102	102	108	4
2 1/2"	77	121	121	127	4
3"	90	134	134	146	4
3 1/2"	102	159	159	162	4
4"	115	162	172	178	4
5"	141	192	194	213	4
6"	169	218	220	248	4
8"	220	273	277	305	4
10"	274	328	337	359	4
12"	325	378	407	419	4
14"	368	438	448	483	4
16"	420	490	512	537	4
18"	470	540	547	594	8
20"	520	590	604	651	8
22"	560	630	658	702	8
24"	620	690	715	772	8

**Rubber-Steel Gasket  
PROFILE WS**

- Main load gasket -

The WS profile rubber-steel gasket consists of a centring, supporting ring and a sealing ring made of rubber with integrally moulded sealing lips. The centring supporting ring is available in bichrome-plated St 37, stainless steel or plastic.

**Special features:**

- Trouble-free replacement of the rubber sealing ring - as a result the WS profile rubber-steel gasket can be used repeatedly
- Safe use and good handling of the sealing material rubber - even for large nominal diameters
- High impermeability as a result of the self-sealing effect of the sealing lips with internal pressure load, the internal pressure widens the sealing lips and is primarily conducive towards impermeability
- Manufacturing of special dimensions without any additional tooling costs, for an inner diameter of approx. 400 mm and up
- Depending on diameter usable up to approx. 25 bar with a tightening surface pressure of 2 N/mm<sup>2</sup> up to max. 15 N/mm<sup>2</sup>

**Typical applications:**

- Sealing of tank flange connections
- Sealing of special flanges
- Sealing of cooling and condensate pipelines in power plants

## Works standard 182 for DIN flanges (PN 10 PN 25)

Example order:

Profile WS, NBR/1.4541, DN 300, PN 10, works standard 182

Dimensions in mm

DN	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>			s <sub>1</sub>
			PN 10	PN 16	PN 25	
10	18	45	45	45	45	4
15	22	50	50	50	50	4
20	28	60	60	60	60	4
25	35	70	70	70	70	4
32	43	82	82	82	82	4
40	49	92	92	92	92	4
50	61	102	107	107	107	4
65	77	121	127	127	127	4
80	90	134	142	142	142	4
100	115	162	162	162	168	4
125	141	192	192	192	195	4
150	169	218	218	218	225	4
175	195	248	248	248	255	4
200	220	273	273	273	285	4
250	274	328	328	330	342	4
300	325	378	378	385	402	4
350	368	438	438	445	458	4
400	420	490	490	497	515	4
450	470	540	540	557	565	8
500	520	590	595	618	625	8
600	620	690	695	735	730	8
700	720	800	810	805	830	8
800	820	900	915	910	940	8
900	920	1010	1015	1010	1040	8
1000	1020	1110	1120	1125	1150	8
1200	1220	1310	1340	1340	1360	8
1400	1420	1510	1545	1540	1575	8
1600	1620	1710	1770	1760	1795	8
1800	1820	1910	1970	1960	2000	8
2000	2020	2110	2180	2165	2230	8
2200	2220	2310	2380	2375	-	8
2400	2420	2510	2590	2585	-	8
2600	2620	2710	2790	2785	-	8
2800	2820	2910	3010	-	-	8
3000	3020	3110	3225	-	-	8

Further dimensions on request. Gaskets for PN6 flanges on request.

## Works standard 184 for ASME B16.47 series A<sup>1)</sup> flanges (class 150 lbs to class 300 lbs)

Gasket made of extruded profile, butt-vulcanised

Example order:

Profile WS, NBR/1.4541, NPS 26", class 150 lbs, works standard 184

Dimensions in mm

NPS	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>		s <sub>1</sub>
			class 150	class 300	
26"	665	745	771	832	8
28"	720	800	829	895	8
30"	770	850	880	949	8
32"	820	900	937	1003	8
34"	865	945	987	1054	8
36"	920	1010	1045	1114	8
38"	965	1045	1108	1051	8
40"	1020	1110	1159	1111	8
42"	1070	1160	1216	1162	8
44"	1120	1210	1273	1216	8
46"	1170	1260	1324	1270	8
48"	1220	1310	1381	1321	8
50"	1270	1360	1432	1375	8
52"	1320	1410	1489	1425	8
54"	1370	1460	1546	1489	8
56"	1430	1520	1603	1540	8
58"	1475	1565	1660	1590	8
60"	1530	1620	1711	1641	8

<sup>1)</sup> Previously MSS SP-44

## Works standard 185 for ASME B16.47 series B<sup>2)</sup> flanges (class 150 lbs to class 300 lbs)

Gasket made of extruded profile, butt-vulcanised

Example order:

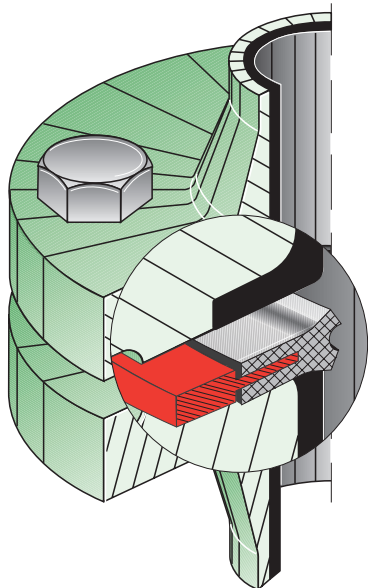
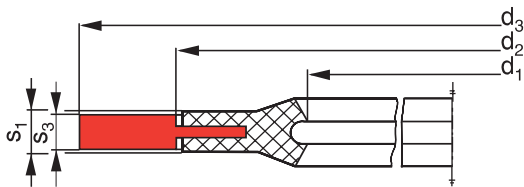
Profile WS, NBR/1.4541, NPS 26", class 150 lbs, works standard 185

Dimensions in mm

NPS	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>		s <sub>1</sub>
			class 150	class 300	
26"	650	720	722	768	8
28"	700	770	773	822	8
30"	745	815	824	883	8
32"	795	875	878	937	8
34"	850	930	932	991	8
36"	900	980	984	1045	8
38"	950	1040	1041	1095	8
40"	1000	1090	1092	1146	8
42"	1050	1140	1143	1197	8
44"	1100	1190	1194	1248	8
46"	1150	1240	1252	1314	8
48"	1200	1290	1303	1365	8
50"	1250	1340	1354	1416	8
52"	1300	1390	1405	1467	8
54"	1350	1440	1460	1527	8
56"	1400	1490	1511	1591	8
58"	1450	1540	1576	1653	8
60"	1500	1590	1627	1703	8

<sup>2)</sup> Previously API 605

Further dimensions on request.



**Works standard 178 for DIN flanges (PN 10 to PN 160)**

Example order:

Profile WL, NBR/ST37 bichrome-plated, DN 200, PN 63, works standard 178

Dimensions in mm

DN	d <sub>1</sub>	d <sub>2</sub>	PN							s <sub>1</sub>	s <sub>3</sub>
			10	16	25	d <sub>3</sub>					
10	18	37	45	45	45	45	56	56	56	4	3
15	22	39	50	50	50	50	61	61	61	4	3
20	28	45	60	60	60	60	-	-	-	4	3
25	35	55	70	70	70	70	82	82	82	4	3
32	43	63	82	82	82	82	-	-	-	4	3
40	49	75	92	92	92	92	103	103	103	4	3
50	61	82	107	107	107	107	113	119	119	4	3
65	77	97	127	127	127	127	137	143	143	4	3
80	90	115	142	142	142	142	148	154	154	4	3
100	115	149	162	162	168	168	174	180	180	4	3
125	141	175	192	192	195	195	210	217	217	4	3
150	169	205	218	218	225	225	247	257	257	4	3
175	195	235	248	248	255	267	277	287	284	4	3
200	220	260	273	273	285	292	309	-	324	4	3
250	274	309	328	330	342	353	364	391	388	4	3
300	325	360	378	385	402	418	424	458	458	4	3
350	368	400	438	445	458	475	486	512	-	4	3
400	420	460	490	497	515	547	543	572	-	4	3
450	470	515	540	557	565	572	-	-	-	8	6
500	520	565	595	618	625	628	657	704	-	8	6
600	620	665	695	735	730	745	764	813	-	8	6
700	720	775	810	805	830	850	879	950	-	8	6
800	820	875	915	910	940	970	988	-	-	8	6
900	920	985	1015	1010	1040	1080	1108	-	-	8	6
1000	1020	1085	1120	1125	1150	1190	1220	-	-	8	6
1200	1220	1295	1340	1340	1360	1395	1452	-	-	8	6
1400	1420	1495	1545	1540	1575	1615	-	-	-	8	6
1600	1620	1705	1770	1760	1795	1830	-	-	-	8	6
1800	1820	1905	1970	1960	2000	-	-	-	-	8	6
2000	2020	2105	2180	2165	2230	-	-	-	-	8	6
2200	2220	2305	2380	2375	-	-	-	-	-	8	6
2400	2420	2505	2590	2585	-	-	-	-	-	8	6
2600	2620	2705	2790	2785	-	-	-	-	-	8	6
2800	2820	2905	3010	-	-	-	-	-	-	8	6
3000	3020	3105	3225	-	-	-	-	-	-	8	6

Gaskets for PN6 flanges on request.

**Rubber-Steel Gasket PROFILE WL**

- Off-load gasket -

The WL profile rubber-steel gasket consists of a bichrome-plated St37 supporting ring and a rubber sealing ring with integrally moulded sealing lips. The supporting ring is also available in stainless steel or plastic.

In contrast to conventional gaskets the rubber sealing ring of the WL profile rubber-steel gasket is in the off-load. This means that the supporting ring absorbs all the forces which are too high for the rubber sealing ring. A further advantage is that the rubber sealing ring is shut up on the outside by the supporting ring. As a result of the sealing in the off-load both very high internal pressures and additional forces from the pipeline system are allowed. The WL profile rubber-steel gasket combines the advantages of a rubber gasket with those of a metal gasket.

**Special features:**

- No overloading of the rubber sealing ring is possible if pipes are installed vertically, for example in well building conventional rubber-steel gaskets are continually overstressed depending upon the weight of the pipelines which have been installed above
- Reliable sealing even with strong pressure cycles or shocks
- Simple and safe assembly, assembly faults due to applying too high and varying tightening torque will be minimised (most frequent reason for the failure of a rubber-steel gasket)
- Trouble-free replacement of the rubber sealing ring, therefore reusable
- Advantages as a result of the flexible sealing lip, as already explained with the WS profile rubber-steel gasket
- Manufacture of special dimensions without any additional tooling costs, for an inner diameter of approx. 400 mm and up
- Very large application range, depending on diameter usable up to approx. 100 bar with a tightening surface pressure of 12 N/mm<sup>2</sup> up to max. 250 N/mm<sup>2</sup> with a supporting ring made of steel

**Typical applications:**

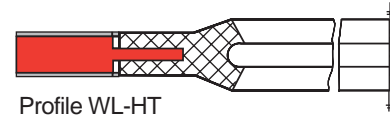
- High-pressure pipelines, e.g. gas pipelines for gas supplies, gas pressure regulator systems
- Pipeline construction, e.g. underground pipelines
- Flue gas purification plants and cooling circuits in power plants
- Pipeline and appliance construction with partially rubberised flange sealing surfaces

We are readily at your disposal with our design recommendations to ascertain the flange groove for the rubber coating.

**Rubber-steel gaskets WL profile with a bichrome-plated St37 supporting ring are shortly available at current used nominal diameters of DIN flanges.**

# Rubber-Steel Gasket PROFILE WL-HT

- Off-load gasket - **HTB-tested** -



The WL-HT profile rubber-steel gasket is in principle design in the same way as the WL profile gasket, but the supporting ring is equipped with graphite layers. The rubber sealing lip is made of NBR 50219.0 (approved for gas and drinking water supplies) and the supporting ring is of bichrome-plated St37. Normally, the rubber sealing lip acts as the primary gasket. Under **high thermal load**, e.g. in the event of a fire, the supporting ring with graphite layers seals as an auxiliary gasket.

### Special features:

- Approved and tested under **high thermal load (HTB)\*** at 650°C, 30 minutes for use in flange joints (DN 25 to DN 200) by the DVGW (German Association of Gas and Water Experts) research unit in Karlsruhe in conformity with DWGW-VP 301, DIN 33822 and DIN 3374.  
\*comparable to fire safe test according to BS 6755
- All the features of the WL profile rubber-steel gasket
- By replacing the rubber sealing ring and the graphite layers, the WL-HT profile rubber-steel gasket can be reused

### Typical applications:

- House gas installation with flanged house lead-in combinations, pressure regulators, gas meters
- Gas stations
- Drinking water pipes with attached fire-fighting systems according to DIN 1988-6.

Ask for our individual brochure "WL-HT profile rubber-steel gasket", "Gas and water meter gaskets for threaded joints", the special print from the DELIWA 'ndz' magazine "The HTB requirements on gaskets in house gas installation" and our test reports (Only in German Language).

## Works standard 179 for ANSI B 16.5 flanges (class 150 lbs to class 2500 lbs)

Example order:

Profile WL, NBR/1.4541, NPS 5", class 150 lbs, works standard 179

Dimensions in mm

NPS	d <sub>1</sub>	d <sub>2</sub>	class							s <sub>1</sub>	s <sub>3</sub>	
			150	300	400	600	900	1500	2500			
½"	16	32	45	51	51	51	61	61	67	67	4	3
¾"	22	39	54	64	64	64	67	67	73	73	4	3
1"	28	45	64	70	70	70	76	76	83	83	4	3
1¼"	35	55	73	80	80	80	86	86	102	102	4	3
1½"	43	63	83	93	93	93	95	95	114	114	4	3
2"	61	82	102	108	108	108	140	140	143	143	4	3
2½"	77	97	121	127	127	127	162	162	165	165	4	3
3"	90	115	134	146	146	146	165	172	194	194	4	3
3½"	102	128	159	162	159	159	-	-	-	-	4	3
4"	115	149	172	178	175	191	203	207	232	232	4	3
5"	141	175	194	213	210	238	245	251	276	276	4	3
6"	169	205	220	248	245	264	286	280	314	314	4	3
8"	220	260	277	305	302	318	356	349	384	384	4	3
10"	274	309	337	359	356	397	432	432	473	473	4	3
12"	325	360	407	419	416	454	496	518	546	546	4	3
14"	368	400	448	483	480	489	518	575	-	-	4	3
16"	420	460	512	537	534	562	572	638	-	-	4	3
18"	470	515	547	594	591	610	635	702	-	-	8	6
20"	520	565	604	651	645	680	696	753	-	-	8	6
22"	560	605	658	702	-	730	-	-	-	-	8	6
24"	620	665	715	772	766	788	835	899	-	-	8	6

## Works standard 180 for ASME B16.47 series A flanges (previously MSS SP44) (class 150 lbs to class 900 lbs)

Example order:

Profile WL, NBR/1.4541, NPS 26", class 150 lbs, works standard 180

Dimensions in mm

NPS	d <sub>1</sub>	d <sub>2</sub>	class				s <sub>1</sub>	s <sub>3</sub>	
			150	300	400	600			900
26"	665	720	771	832	829	864	880	8	6
28"	720	775	829	895	889	911	943	8	6
30"	770	825	880	949	943	968	1006	8	6
32"	820	875	937	1003	1000	1019	1070	8	6
34"	865	920	987	1054	1051	1070	1133	8	6
36"	920	975	1045	1114	1114	1127	1197	8	6
38"	965	1020	1108	1051	1070	1102	1197	8	6
40"	1020	1075	1159	1111	1124	1152	1248	8	6
42"	1070	1125	1216	1162	1175	1216	1298	8	6
44"	1120	1175	1273	1216	1229	1267	1365	8	6
46"	1170	1225	1324	1270	1286	1324	1432	8	6
48"	1220	1275	1381	1321	1343	1387	1483	8	6
50"	1270	1325	1432	1375	1400	1445	-	8	6
52"	1320	1375	1489	1425	1451	1495	-	8	6
54"	1370	1425	1546	1489	1515	1552	-	8	6
56"	1430	1485	1603	1540	1565	1610	-	8	6
58"	1475	1530	1660	1590	1616	1660	-	8	6
60"	1530	1585	1711	1641	1680	1730	-	8	6

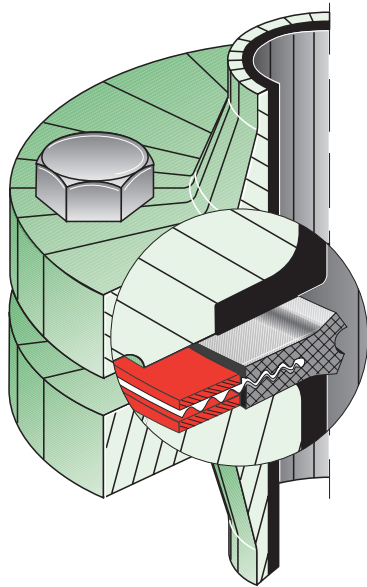
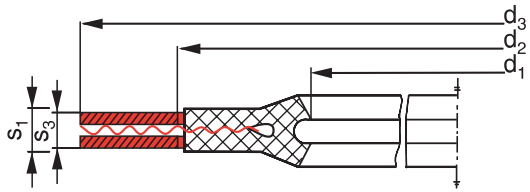
## Works standard 181 for ASME B16.47 series B flanges (previously API 605) (class 150 lbs to class 900 lbs)

Example order:

Profile WL, NBR/1.4541, NPS 26", class 150 lbs, works standard 181

Dimensions in mm

NPS	d <sub>1</sub>	d <sub>2</sub>	class				s <sub>1</sub>	s <sub>3</sub>	
			150	300	400	600			900
26"	650	695	722	768	743	762	835	8	6
28"	700	745	773	822	797	816	899	8	6
30"	745	790	824	883	854	876	956	8	6
32"	795	840	878	937	908	930	1013	8	6
34"	850	895	932	991	959	994	1070	8	6
36"	900	945	984	1045	1019	1045	1121	8	6
38"	950	1000	1041	1095	1070	1102	1197	8	6
40"	1000	1050	1092	1146	1124	1152	1248	8	6
42"	1050	1100	1143	1197	1175	1216	1298	8	6
44"	1100	1150	1194	1248	1229	1267	1365	8	6
46"	1150	1205	1252	1314	1286	1324	1432	8	6
48"	1200	1255	1303	1365	1343	1387	1483	8	6
50"	1250	1305	1354	1416	1400	1445	-	8	6
52"	1300	1355	1405	1467	1451	1495	-	8	6
54"	1350	1405	1460	1527	1515	1552	-	8	6
56"	1400	1455	1511	1591	1565	1604	-	8	6



**Works standard 169 for DIN flanges (PN 10 to PN 160)**

Example order:

Profile WL, NBR/1.4541, DN 200, PN 16, works standard 169

Dimensions in mm

DN	PN									s <sub>1</sub>	s <sub>3</sub>
	d <sub>1</sub>	d <sub>2</sub>	10	16	25	d <sub>3</sub>			40		
10	18	37	45	45	45	45	56	56	56	3,5	3
15	22	41	50	50	50	50	61	61	61	3,5	3
20	28	49	60	60	60	60	-	-	-	3,5	3
25	35	59	70	70	70	70	82	82	82	4,5	4
32	43	67	82	82	82	82	-	-	-	4,5	4
40	49	73	92	92	92	92	103	103	103	4,5	4
50	61	92	107	107	107	107	113	119	119	4,5	4
65	77	108	127	127	127	127	137	143	143	4,5	4
80	90	121	142	142	142	142	148	154	154	4,5	4
100	115	150	162	162	168	168	174	180	180	5,5	5
125	141	176	192	192	195	195	210	217	217	5,5	5
150	169	204	218	218	225	225	247	257	257	5,5	5
200	220	255	273	273	285	292	309	-	324	5,5	5
250	274	309	328	330	342	352	364	391	388	5,5	5
300	325	362	378	385	402	418	424	458	458	5,5	5
350	368	415	438	445	458	475	486	512	-	7	6
400	420	467	490	497	515	547	543	572	-	7	6
450	470	517	540	557	565	572	-	-	-	7	6
500	520	567	595	618	625	628	657	704	-	7	6
600	620	667	695	735	730	745	764	813	-	7	6
700	720	772	810	805	830	850	879	950	-	7	6
800	820	872	915	910	940	970	988	-	-	7	6
900	920	985	1015	1010	1040	1080	1108	-	-	10	9
1000	1020	1085	1120	1125	1150	1190	1220	-	-	10	9
1200	1220	1285	1340	1340	1360	1395	1452	-	-	10	9
1400	1420	1485	1545	1540	1575	1615	-	-	-	10	9
1600	1620	1705	1770	1760	1795	1830	-	-	-	10	9
1800	1820	1905	1970	1960	2000	-	-	-	-	10	9
2000	2020	2105	2180	2165	2230	-	-	-	-	10	9
2200	2220	2305	2380	2375	-	-	-	-	-	10	9
2400	2420	2505	2590	2585	-	-	-	-	-	10	9
2600	2620	2705	2790	2785	-	-	-	-	-	10	9
2800	2820	2905	3010	-	-	-	-	-	-	10	9
3000	3020	3105	3225	-	-	-	-	-	-	10	9

**Rubber-Steel Gasket PROFILE WL2**

- Off-load gasket -

The WL2 profile rubber-steel gasket consists of a rubber sealing ring with an integrally moulded sealing lip and a supporting ring made of stainless steel. The supporting ring is designed of an elastic corrugated ring, which is connected by spot welding on both sides with a flat ring at the outer area. The rubber sealing ring has an undulating profile in the slot for the supporting ring adapted to the corrugated ring.

**Special features:**

- In the event of flange torsion the steel supporting ring gives way a little due to the elastic corrugated ring so that the flange does not lift so much in the inner sealing area
- The WL2 profile rubber-steel gasket can be used for vacuum operation because the rubber sealing lip cannot be extracted because of the corrugated slot
- The WL2 profile rubber-steel gasket has nearly the same properties as the WL profile rubber-steel gasket

**Typical applications:**

- Condensate and cooling water pipes as well as flue gas purification plants in power plants
- In the chemical industry

**Gasket parameters**

Explanatory remarks on the gasket calculation values. The minimum surface pressure for installation  $\sigma_v$  and the maximum allowed surface pressure  $\sigma_\theta$  at temperature are the limits of the gasket application.

See "The optimisation of static gaskets"

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**Main load:**

Profile	Material	Designation	Unit	Temp. $\vartheta$ in the area of the gasket	
				0°C	100°C
<b>WG</b>	NBR, CR,	$\sigma_v$	N/mm <sup>2</sup>	2	2
<b>WG2</b>	NR*, EPDM,	$\sigma_\theta$	N/mm <sup>2</sup>	15	6
<b>WS</b>	CIIR, CSM				
<b>WG</b>	FKM	$\sigma_v$	N/mm <sup>2</sup>	2	2
<b>WG2</b>	H-NBR	$\sigma_\theta$	N/mm <sup>2</sup>	15	7
<b>WS</b>					

\* only up to 80°C

## Off-load:

Profile	Material	Designation	Unit	Temp. $\vartheta$ in the area of the gasket	
				0°C	100°C
WL	Steel St37	$\sigma_{V,KNS}$ $\sigma_{\vartheta}$	N/mm <sup>2</sup>	12	12
	corrosion protected stainless steel			250	250
	NBR, CR, NR*, EPDM, CIIR, FKM				
WL2	Special steel	$\sigma_{V,KNS}$ $\sigma_{\vartheta}$	N/mm <sup>2</sup>	12	12
	NBR, CR, NR*, EPDM, CIIR, FKM			150	150
WL	Polyamide	$\sigma_{V,KNS}$ $\sigma_{\vartheta}$	N/mm <sup>2</sup>	12	12
	NBR, CR, NR*, EPDM, CIIR, FKM			60	55

\* only up to 80°C

## Qualities of rubber for rubber-steel gaskets

Quality	Temperature range in °C
NBR e.g. Perbunan	-30 to 100
NBR* 50219.0	-30 to 100
H-NBR e.g. Therban	-25 to 150
NR natural rubber	-50 to 80
EPDM e.g. Buna AP	-40 to 120
EPDM peroxide reticulation	-40 to 140
FKM e.g. Viton	-20 to 200
CSM e.g. Hypalon	-20 to 120
CR** e.g. neoprene	-25 to 120
VMQ silicone rubber	-60 to 180
CIIR chlorbutyl rubber	-40 to 120
TFE/P Aflas	-20 to 200
ACM e.g. VAMAC	-25 to 140

Thermal resistance is related to air

\* approved for use in gas and drinking water supplies

- no double stockkeeping
- no risk of confusion

Approved in keeping with:

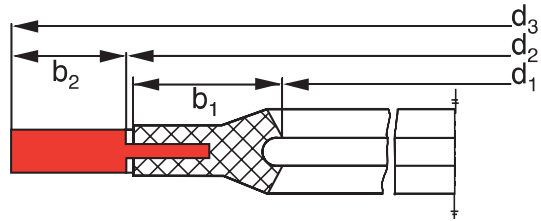
- DVGW-DIN 3534-3 Reg. no. 97-0158-GNE
- KTW recommendation part 1.3.13 section D1 + D2 (Physiological safeness test)
- DVGW work sheet W270 (Microbiological safeness test)

Ask for our test reports.



\*\* also available in electrically conductive version

All details are not binding. Please contact our engineering consultancy service with your specific application. Further qualities on request.



## Note on the calculation of the bolting load

### for WG, WG2, WS

The surface pressure  $\sigma$  brought about by the entire bolting load  $F_s$  must be checked for WG, WG2 and WS profile gaskets by means of the following relation:

$$\sigma = \frac{4 \cdot F_s}{(d_2^2 - d_1^2) \cdot \pi}$$

The surface pressure  $\sigma$  have not exceed the values  $\sigma_{\vartheta}$  specified in the table of gasket parameters.

The sealing dimension must always be considered - in other words:

- If diameter  $d_2$  is greater than the raised face diameter, then the raised face diameter must be considered
- If diameter  $d_2$  is smaller than the raised face diameter, then the diameter  $d_2$  must be considered

The deviation of the bolting tightening procedure must be taken into consideration.

### for WL, WL-HT, WL2

$$F_{SO, \min} = (d_1 + b_1) \cdot \pi \cdot b_1 \cdot \sigma_{V,KNS}$$

$$b_1 \sim \frac{d_2 - d_1}{2}$$

$$F_{SO, \max} = (d_2 + b_2) \cdot \pi \cdot b_2 \cdot \sigma_{\vartheta}$$

$$b_2 = \frac{d_3 - d_2}{2}$$

$\sigma_{V,KNS}$  = Pre-deformation surface pressure for the off load to calculate the minimum bolting load.

In order to calculate the maximum bolting load for flanges with raised face - in order to calculate  $b_2$  - the raised face diameter, instead of  $d_3$ , must be considered.

Literature:

Tückmantel, H.-J.: The optimisation of static gaskets.

1. engl. edition. Oberhausen, Kempchen Publishing 1991

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