Garlock
an EnPro Industries family of companies

Garlock Butterfly Valves

Trusted throughout chemical, petrochemical and many other industries

Europe, Middle East

Leaders in Sealing Integrity

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Garlock Butterfly Valves

For corrosive and abrasive media

The economic advantages of reduced maintenance, smooth operation and exceptional service life are proven over and over again. Garlock valves set the standards in TA-Luft compliance. The reliability of Garlock butterfly valves is not only appreciated and well known at our customers but also certified with SIL 3 according to EN 61508.

GAR-SEAL

GAR-SEAL valves are used extensively where corrosive, abrasive and toxic media needs to be reliably controlled. They are typically used for accurate control, throttling and shut-off duties in the chemical, petrochemical, chlorine, paper, electro-plating and many other industries. GAR-SEAL butterfly valves offer reduced maintenance requirements and increased operational reliability.

MOBILE-SEAL

MOBILE-SEAL valves are used on road tanker vehicles, railway wagons, silos and other transportation and storage containers where high chemical resistance, reliability and special safety requirements are essential. MOBILE-SEAL is EN 14432 approved.

SAFETY-SEAL

SAFETY-SEAL valves are used in applications where corrosive, abrasive and toxic media needs to be handled and electrostatic charges must be avoided at the same time.

STERILE-SEAL

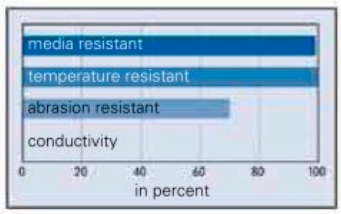
STERILE-SEAL valves are used on duties where sterile processes need to be maintained in the pharmaceutical and food industries without unnecessary and costly overhauls and replacement. The special characteristic of this valve is its external sterilization capability. The design is such that the critical „dead" areas of the valve, as well as the disc, body liner and seals, can be sterilized with steam without coming in contact with the process medium.

The correct type of lining

Operating temperature:
-40 °C up to +200 °C
-40 °F up to +392 °F

PTFE

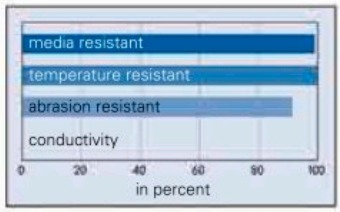
Void-free body liner and disc isostatic molded from virgin PTFE. High material density >2.16 g/cm³. Guaranteed lining thickness of at least 3 mm plus high crystallinity. FDA conform.



Operating temperature:
-40 °C up to +200 °C
-40 °F up to +392 °F

Abrasive PTFE

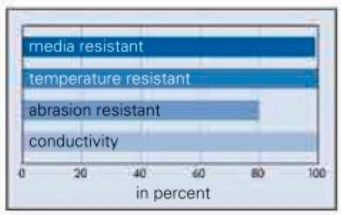
Is the chemical resistance of PTFE needed and the media also provided with abrasive characteristics, the use of PTFE anti-abrasive is recommended. This special PTFE compound is essentially resistant to mechanical wear with almost the same chemical resistance as virginal PTFE. Is the chemical resistance of PTFE



Operating temperature:
-40 °C up to +200 °C
-40 °F up to +392 °F

Antistatic PTFE

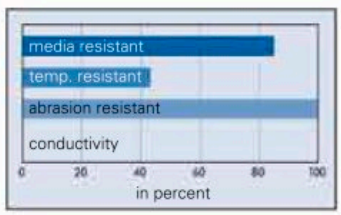
For explosive environments and medias this electrostatically conductive lining is available. The service life is comparable to the values for valves lined with PTFE. The material is FDA conform. TÜV approval (TÜV 941 F 416 601).
Surface resistance ≤ 10^6 Ω.
Volume resistance ≤ 10^6 Ω cm.



Operating temperature:
-40 °C up to + 85 °C
-40 °F up to +185 °F

UHMWPE

Used in extremely abrasive media applications while offering excellent chemical resistance. Garlock offers a complete, ultra high molecular weight PE (UHMWPE) liner and encapsulated disc.



With reliability at the forefront

Section through the head flange
The shaft is sealed against atmospheric pollution and corrosion by two O-rings. TA-Luft compliant sealing is standard. If control connection is needed, it can be integrated to observe the shaft tightness.

Body
According to Pressure Equipment Directive the bodies of Garlock valves are approved by TÜV Rheinland according to DIN 3840 and EN 12516.

Flange types
The valves are available in Wafer, Lug and wafer tank truck type.

Design
The two piece design of shaft and disc allows an easy change of disc and liner. To your convenience disc and liner can be delivered as a pre assembled set.

Shaft sealing
The fully reliable shaft sealing system with the Garlock seal rings guarantees tightness over a long period. The shaft sealing system consists of two barriers. The first is an area where disc and liner are pressed together. The second barrier is the Garlock seal ring which includes a PTFE-ring energized by two O-rings. The long extensively approved system is completely maintenance free. The structure allows easy maintenance and replacement of disc and liner on site without special tools. The shaft sealing is certified according to „TA-Luft" and exceeds the requirements.

Quality assurance
Garlock valves set the standard in high quality. To ensure this and guarantee a long reliable life time the Garlock quality management system is certified according to ISO 9001 and DGRL 2014/68/EU Module H1. Each valve is extensively tested according to EN 12266 before leaving our factory. To ensure absolute traceability of the materials each valve is tagged with a serial number on a stainless steel tag. Based on the serial number, material certificates for body parts, PTFE/UHMWPE resins, shaft and steel disc can be provided. This high standard guarantees absolute quality, control and transparency.

Certificates and approvals
» DIN EN ISO 9001:2008
» 2014/68/EU
» Material certificate EN 10204 - 3.1
» Testing according to EN 12266
» 100% spark test of all PTFE and UHMWPE parts

Materials

Housing materials

It is standard practice that the housings of the Garlock valves and fittings are manufactured from high-quality ductile cast iron (EN-JS 1049). Depending on the intended use, however, other materials, such as cast steel (1.0619) and stainless steel (1.4581) are also available. All housings are manufactured and inspected in accordance with the specification of the pressure equipment directive.

Liner

Depending on the intended use, a large selection of lining materials is available. To provide reliable seals, PTFE is available in several versions as well as UHMWPE. All lining materials are manufactured by specialists and inspected comprehensively. Your contact for Garlock products will be happy to assist you in selecting the suitable material.

Elastomers

» Silicon (standard)
» EPDM
» FKM
» Neoprene

Disc

The disc is also available in different materials depending on application. Along side plastics such as PTFE and UHMWPE, stainless steel, Hastelloy C22 or Titan Grade 2 are an option. All discs are manufactured by specialists and inspected comprehensively.

Marking

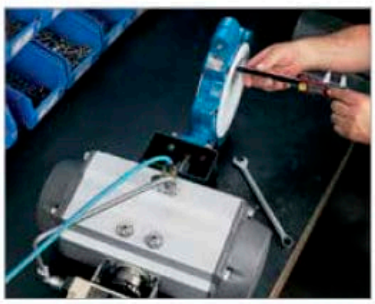
Each valve is tagged with a stainless steel plate. All information such as dimension, serial number, type, materials, operating pressure and temperature, flange connection and certification are engraved.

Production

All processes have been defined through our ISO 9001 quality assurance system. The system is regularly reviewed and constantly developed. Quality, service and flexibility of the highest order are standard requirements we impose on ourselves and all our suppliers.

Approvals
» 2014/68/EU
» TA Luft / VDI 2440
» EN 61508 - SIL
» EN 14432 (MOBILE-SEAL)
» FDA
» EG 1935/2004
» ISO 15848-1 AH

Due to our production facility in Germany and stock all over the world, we are in a position to react to your requirements in a very short time, worldwide.



We manufacture each valve according to customers requirements. In doing so, we carry out all necessary configurations as per your specifications.

Custom-tailored service

We are happy to help you to find the most suitable product for your particular application. In this respect, we have a high number of standard products available to you. In addition, project planning and design of custom-made solutions for our customers is one of our strengths, where we draw on decades of experience as a global manufacturer of seals and valves.

We offer professional consulting and project planning that is geared towards your requirements. Your benefit from our individual on-site support services which are specifically tailored to meet your company's needs. We conduct training seminars, help optimize inventory, reduce emissions, ensure functionality and prevent costly downtime. Our experienced employees will be happy to assist you at any time.

Test engineering

Testing
All our valves are tested according to EN 12266-1 before they are sent out to you. Standard tests are body strength (P10), body tightness (P11) and seat tightness (P12). Also a functional test is performed.

To ensure constant high quality valves all components are subjected to stringent testing running in parallel with all stages of production.

Dimensions of liner thickness
On all PTFE parts, the liner thickness is also checked in accordance with specific measuring methods. The test ensures that the required thicknesses are adhered reliably for all parts. This measure is indicative of the special attention paid to quality requirements of Garlock valves.

This guarantees a long and reliable lifetime of PTFE and UHMWPE parts during operation.

Vacuum
Garlock valves are suitable for use in a vacuum. For use in practical applications at elevated temperatures and simultaneously high vacuums there are special vacuum linings with increased wall thickness available.

Conductivity
The PTFE body lining and the lining of the disc of the SAFETY-SEAL (conductive version) are all checked for the required conductivity.

These measurements are carried out with the resistivity measurement device in accordance with the specific guidelines. This ensures that electrostatic loads are safely discharged during operations.

Standards

Garlock Butterfly Valves provide improved reliability

Face-to-face dimensions

» DIN EN 558-1 GR 20, (DN 350 GR25)
» ISO 5752 Table 5 short
» ASME B16.10
(2" to 12" Table Narrow
14" to 24" Table Wide)
» MSS-SP 67
(2" to 12" Table Narrow
14" to 24" Table Wide)
» API 609
(2" to 12" Category A Table 2
14" to 24" Category B Table 3)

Head flange

» EN ISO 5211
» NF E 29-402

Body types

» Wafer
» Lug
» Tank truck
» With long neck for insulation in accordance with HeizAnl.V (German Heating Installations Ordinance)

Body strength

» DIN EN 12516 T2 (DIN 3840), tested within the scope certification according to 2014/68/EU Module H1

Body materials

» Spheroidal graphite cast iron (EN-JS1049, 0.7043)
» Cast steel (GS-C 25, 1.0619)
» Stainless steel casting (G-X5CrNiMoNb 18 10, 1.4581)

Flange connection

» EN 1092 PN 10/16 (Design A/B)
» ASME B16.5 Class 150 lbs (Design RF, FF)
» DIN 28459

Testing

» EN 12266 P10
» EN 12266 P11
» EN 12266 P12 Leak rate A

PTFE lining

» void-free
» isostatic pressed
» high density (min. 2.16 g/cm³)
» lining thickness min. 3 mm
» vacuum lining up to 10 mm available

Vacuum tightness

» $q\ ^{He}max < 10^{-6}$ mbar $1 \cdot s^{-1}$

Identification

» DIN EN 19
» AD 2000 data sheet A4

Valve disc alignment

» Centrally, i.e. energy-saving

Characteristic

» Linear

SAFETY-SEAL

Applications

SAFETY-SEAL valves are used in applications where corrosive, abrasive and toxic media need to be insulated against electrostatic charges. SAFETY-SEAL valves offer long life and reduced maintenance effort and extra safety.

SAFETY-SEAL

Dimensions
» DN 50 / 2" up to DN 600 / 24"

Flange connection
» EN 1092 PN 10/16 (Design A/B)
» ASME B16.5 class 150 lbs (design RF/FF)

Face-to-face dimensions
» DIN EN 558-1 GR 20, (DN 350 GR25)
» ISO 5752 Table 5 short
» ASME B16.10
(2" to 12" Table Narrow
14" to 24" Table Wide)
» MSS-SP 67
(2" to 12" Table Narrow
14" to 24" Table Wide)
» API 609
(2" to 12" Category A Table 2
14" to 24" Category B Table 3)

Body strength
» DIN/ EN 12516 T2 (DIN 3840)
» tested within the scope of the inspection body designate by Module H1

Operating pressure
» DN 50/2" - 300/12": 16 bar
» above DN 300/12": 10 bar (depending on operating temperature)

Testing
» EN 12266 P10
» EN 12266 P11
» EN 12266 P12 Leak rate A

Bodies
» Wafer and Lug design with long neck for insulation

Vacuum
» up to 1 mbar absolute (depending on size and temperature)

Temperature range
» -40 °C up to +200 °C
» -40 °F up to +392 °F (depending on material)

Head flange
» EN ISO 5211
» NF E 29-402

Liner
» Antistatic PTFE

MOBILE-SEAL

Applications

MOBILE-SEAL valves are used on road tanker vehicles, railway wagons, silos and other transportation and storage containers where high chemical resistance, reliability and special safety requirements are essential.

MOBILE-SEAL

Dimensions
» DN 50/ 2" up to DN 100 / 4" DIN 28459
» DN 50/ 2" up to DN 150 / 6" EN 1092

Flange connection
» EN 1092 PN 10/16 (Design A/B)
» ASME B16.5 class 150 lbs (design RF/FF)
» DIN 28459 PN10

Face-to-face dimensions
» DIN EN 558-1 GR 20
» ISO 5752 Table 5 short
» ASME B16.10 (2" to 4" Table Narrow)
» MSS-SP 67 (2" to 4" Table Narrow)
» API 609 (2" to 4" Category A Table 2)

Body strength
» DIN/ EN 12516 T2 (DIN 3840)
» tested within the scope of the inspection body designate by Module H1

Operating pressure
» DN 50/2" - 100/4": 10 bar (depending on operating temperature)

Testing
» EN 12266 P10
» EN 12266 P11
» EN 12266 P12 Leak rate A

Bodies
» Wafer and Lug design with long neck for insulation

Vacuum
» up to 1 mbar absolute

Temperature range
» -40 °C up to +200 °C
» -40 °F up to +392 °F (depending on material)

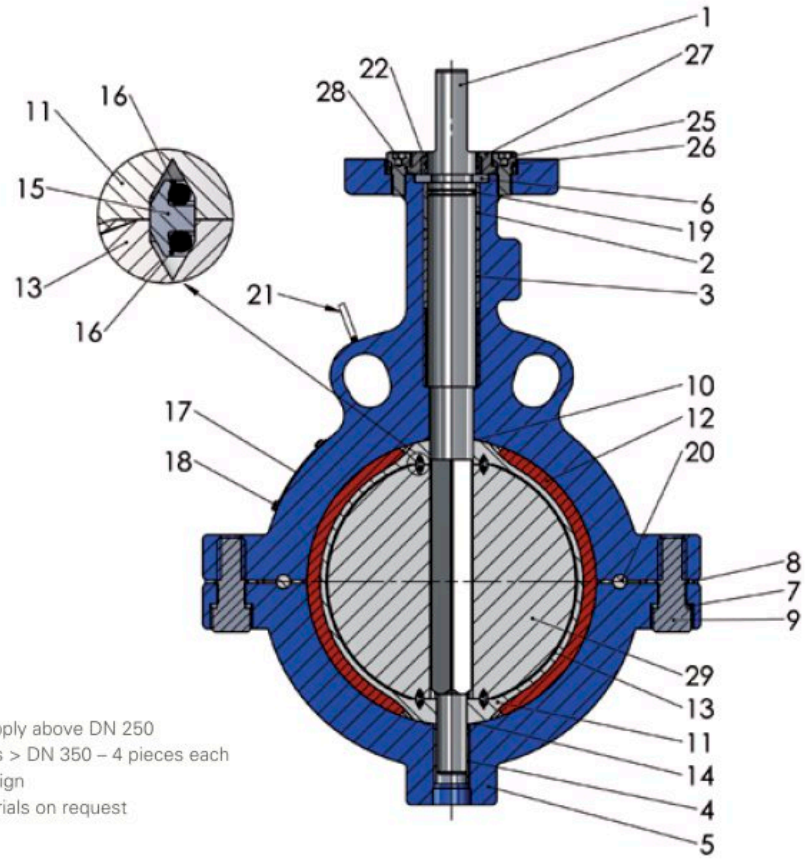
Head flange
» EN ISO 5211
» NF E 29-402

Certification
» EN 14432
» TÜ-AGG 044-84

Liner
» PTFE
» Antistatic PTFE
» Abrasive PTFE
» UHMWPE

GAR-SEAL, SAFETY-SEAL, MOBILE-SEAL

Materials



[1] does not apply above DN 250
[2] Dimensions > DN 350 – 4 pieces each
[3] Special design
[4] other materials on request

Pos.	Qty.	Material	Designation	Pos.	Qty.	Material	Designation
1	1	1.4313 up to DN 300 1.4021 from DN 350	Shaft	14*	1	GYLON®	Bottom gasket
				15*	2	PTFE	Sealring
2	1	Steel/PTFE	Slide bushing (top)	16*	4[4]	Viton	O-Ring (Sealring)
3	2	Steel/PTFE	Slide bushing (center)	17	1	Stainless steel	Nameplate
4	1	Steel/PTFE	Slide bushing (bottom)	18	4	Stainless steel	Rivet
5	1	see material table	Body	19	1[4]	Viton	O-Ring
6	1[1]	PTFE, carbon reinf.	Retaining ring (split)	20*	2	PTFE	Security element
7	2[2]	Stainless steel	Spring washer	21	1[3]	Steel electroplated	Ground connection
8*	2[2]	GYLON®	Washer	22	2[4]	Viton	O-Ring (adapter flange)
9	2[2]	Stainless steel	Body screw	25	4	Stainless steel	Screw
10*	1	GYLON®	Top gasket	26	4	Stainless steel	Spring washer
11*	1	see material table	Lining	27	1	Stainless steel	Head flange
12*	2[4]	Silicone	Elastomer backup-element	28	1	GYLON®	Seal (adapter flange)
13*	1	see material table	Disc	29	1	up to DN 65 1.4404 from DN 80 0.7040 (GGG 40)	Disc insert (only PTFE and UHMWPE lined disc)

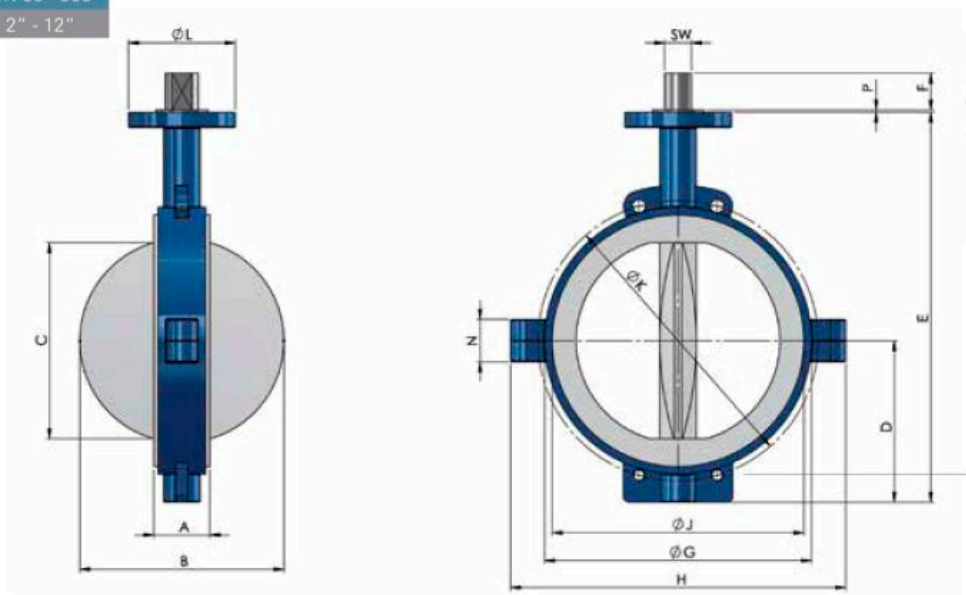
* Spare parts kit (for metallic disc valves without the disc)

GAR-SEAL, SAFETY-SEAL, MOBILE-SEAL

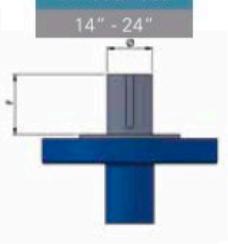
Dimensions, Wafer

Flange connection:	EN 1092 (DIN 2501), PN 10 • PN 16 • ANSI B 16.5,150 LBS
Overall length:	EN 558-1 GR20 (DIN 3202 T3 K1) and ASME B16.10
Head flange:	EN ISO 5211

DN 50 - 300
2" - 12"



DN 350 - 600
14" - 24"



Note:
Lower centering drillings only from DN350/14"

GAR-SEAL + SAFETY-SEAL / MOBILE-SEAL

DN Inch	DN mm	Head flange **	A	B	C	D	E	F	Ø G	H	Ø J	Ø K EN PN10	Ø K ASME 150lbs	Ø L	SW Ø	P	N	Z EN PN 10	Z ASME 150 lbs	Weight kg ***
2	50	F05	43	60	43	62	202	35	102	152	98	125	121	65	10,0	3	40	4xM16	4x5/8"-11	2,6
2 ½	65	F05	46	70	53	70	220	35	121	171	120	145	140	65	10,0	3	40	4xM16	4x5/8"-11	3,5
3	80	F05	46	82	67	79	244	35	133	183	127	160	152	65	10,0	3	40	8xM16	4x5/8"-11	3,8
4	100	F07	52	106	93	95	275	35	162	214	159	180	190	90	13,0	3	50	8xM16	8x5/8"-11	6,2
5	125	F07	56	128	115	108	303	35	192	248	187	210	216	90	13,0	3	50	8xM16	8x3/4"-10	8,6
6	150	F10	56	157	147	121	336	40	218	290	216	240	241	125	17,0	3	56	8xM20	8x3/4"-10	11,6
8	200	F10	60	197	188	150	395	40	273	350	270	295	298	125	17,0	3	56	8xM20	8x3/4"-10	17,4
10	250	F12	68	246	236	179	459	50	328	405	324	350	362	150	22,0	3	60	12xM20	12x7/8" - 9	30,6
12	300	F12	78	295	284	216	536	50	378	455	375	400	432	150	22,0	3	70	12xM20	12x7/8" - 9	38,3
14	350	F14	92*	335	322	265	640	60	438	550	413	460	476	175	44,4	4	70	16xM20	12x 1" - 8	71,5
16	400	F14	102	387	374	305	725	60	489	570	470	515	540	175	44,4	4	70	16xM24	16x 1" - 8	90,6
18	450	F16	114	430	415	320	780	80	539	670	533	565	578	210	44,4	4	70	20xM24	16x1 1/8" - 7	113,0
20	500	F16	127	484	467	355	865	80	594	690	584	620	635	210	44,4	4	70	20xM24	20x1 1/8" - 7	163,5
24	600	F25	154	578	558	415	990	90	695	820	692	725	749	300	63,5	5	76	20xM27	20x1 1/4" - 7	254,0

			EN PN16			
8	200	for PN 16 > DN 150	295		12xM20	
10	250		355		12xM24	
12	300		410		12xM24	

*GR 25 ** EN ISO 5211; all dimensions in millimeters (mm), if not indicated differently

*** Weight for version 111-W

Garlock
an EnPro Industries family of companies

Leaders in Sealing Integrity

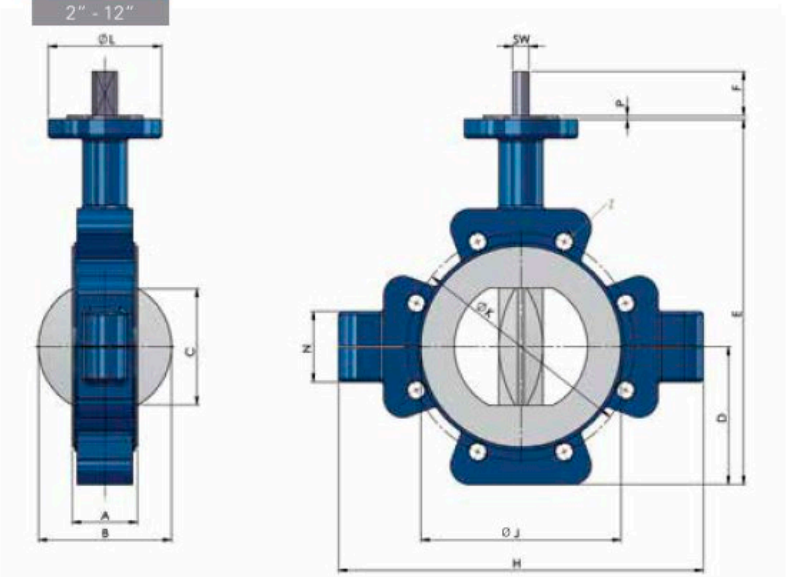
Garlock Butterfly Valves: Trusted throughout chemical, petrochemical and many other industries

GAR-SEAL, SAFETY-SEAL, MOBILE-SEAL

Dimensions, Lug

Flange connection:	EN 1092 (DIN 2501), PN 10 • PN 16 • ANSI B 16.5,150 LBS
Overall length:	EN 558-1 GR20 (DIN 3202 T3 K1) and ASME B16.10
Head flange:	EN ISO 5211

DN 50 - 300
2" - 12"



DN 350 - 600
14" - 24"

GAR-SEAL + SAFETY -SEAL / MOBILE-SEAL

DN Inch	DN mm	Head flange **	A	B	C	D	E	F	H	Ø J	Ø K EN PN10	Ø K ASME 150lbs	Ø L	SW Ø	P	N	Z EN PN 10	Z ASME 150 lbs	Weight kg **
2	50	F05	43	60	43	62	202	35	170	98	125	121	65	10,0	3	45	4xM16	4x5/8"-11	3,6
2 ½	65	F05	46	70	53	70	220	35	193	120	145	140	65	10,0	3	45	4xM16	4x5/8"-11	4,5
3	80	F05	46	82	67	91	256	35	252	127	160	152	65	10,0	3	56	8xM16	4x5/8"-11	7,1
4	100	F07	52	106	93	109	289	35	290	159	180	190	90	13,0	3	56	8xM16	8x5/8"-11	10,2
5	125	F07	56	128	115	120	315	35	312	187	210	216	90	13,0	3	60	8xM16	8x3/4"-10	12,7
6	150	F10	56	157	147	136	351	40	312	216	240	241	125	17,0	3	66	8xM20	8x3/4"-10	17,3
8	200	F10	60	197	188	163	408	40	416	270	295	298	125	17,0	3	76	8xM20	8x3/4"-10	27,0
10	250	F12	68	246	236	200	480	50	508	324	350	362	150	22,0	3	90	12xM20	12x7/8"- 9	41,5
12	300	F12	78	295	284	233	553	50	575	375	400	432	150	22,0	3	110	12xM20	12x7/8"- 9	60,5
14	350	F14	92*	335	322	265	640	60	640	413	460	476	175	44,4	4	70	16xM20	12x 1"- 8	108,0
16	400	F14	102	387	374	305	725	60	720	470	515	540	175	44,4	4	70	16xM24	16x 1"- 8	137,5
18	450	F16	114	430	415	320	780	80	750	533	565	578	210	44,4	4	70	20xM24	16x1 1/8"- 7	153,9
20	500	F16	127	484	467	366	876	80	830	584	620	635	210	44,4	4	70	20xM24	20x1 1/8"- 7	256,0
24	600	F25	154	578	558	415	990	90	960	692	725	749	300	63,5	5	76	20xM27	20x1 1/4"- 7	395,0

			EN PN16			
8	200	for PN 16 > DN 150	295		12xM20	
10	250		355		12xM24	
12	300		410		12xM24	

*GR 25 ** EN ISO 5211; all dimensions in millimeters (mm), if not indicated differently

** Weight for version 111-L

Garlock
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Leaders in Sealing Integrity

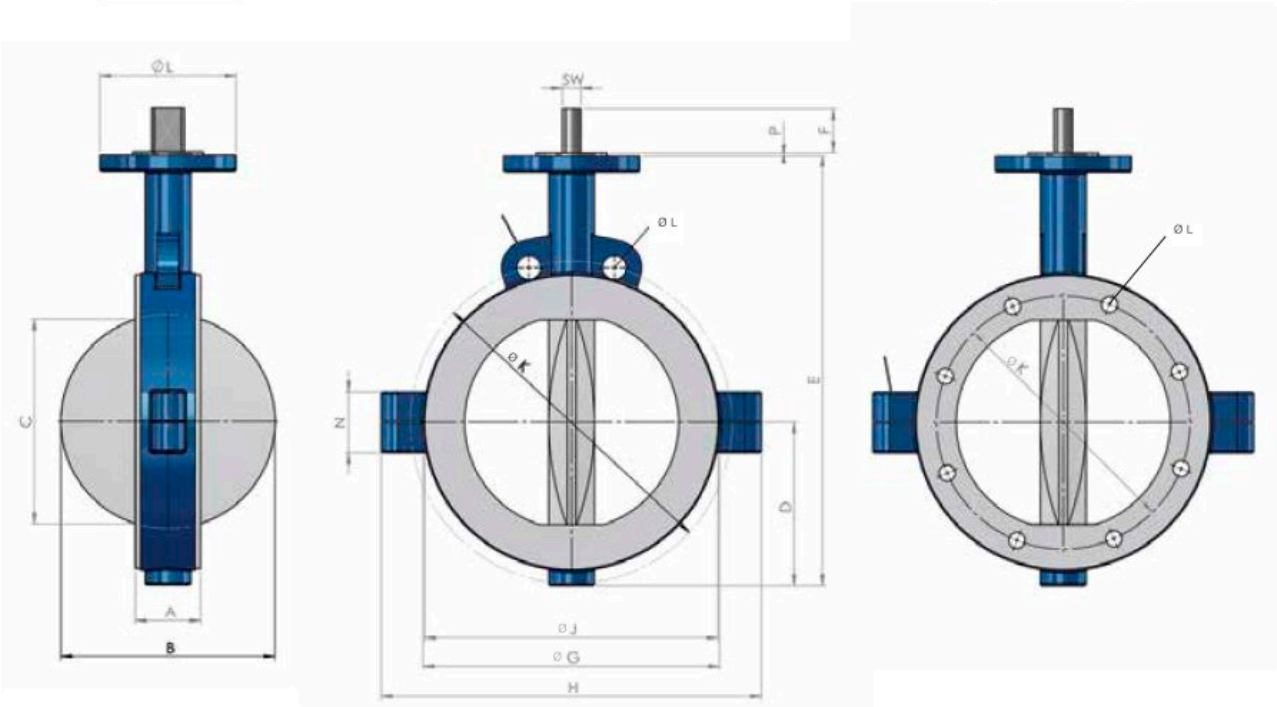
MOBILE-SEAL

Dimensions, Wafer tank truck

Flange connection:	DIN 28459 PN 10
Overall length:	EN 558-1 GR20 (DIN 3202 T3 K1)
Head flange:	EN ISO 5211

DN 50 - 65
2" - 2½"

DN 80 - 100
3" - 4"



	DN Inch	DN mm	Head flange **	A	B	C	D	E	F	Ø G	H	Ø J	Ø K	Ø L	SW	P	N	O	Z	Weight kg ***
MOBILE-SEAL	2	50	F05	43	60	43	62	202	35	102	152	98	130	65	10	3	40	11	8xM10	2,6
	2½	65	F05	46	70	53	70	220	35	121	171	120	130	65	10	3	40	11	8xM10	3,5
	3	80	F05	46	82	67	82	244	35	154	183	127	130	65	10	3	40	11	8xM10	3,7
	4	100	F07	52	106	93	106	275	35	174	217	159	150	90	13	3	40	14	8xM12	6,2

** EN ISO 5211; all dimensions in millimeters (mm), if not indicated differently

*** Weight for version 111-W-TW

STERILE-SEAL

Applications

STERILE-SEAL valves are used where sterile processes need to be maintained in the pharmaceutical and food industries without unnecessary and costly overhauls and replacement. The special characteristic of this valve is its external sterilization capability. By the design of the valve the critical „dead" areas of the valve, as well as the disc, body liner and seals, can be sterilized with steam without contact to the process.

STERILE-SEAL

Dimensions
» DN 50 / 2" up to DN 400 / 16"

Flange connection
» EN 1092 PN 10/16 (Design A/B)
» ASME B16.5 class 150 lbs (design RF/FF)

Face-to-face dimensions
» DIN EN 558-1 GR 20 (DN 350 GR25)
» ISO 5752 Table 5 short
» ASME B16.10 (2" to 12" Table Narrow 14" to 16" Table Wide)
» MSS-SP 67 (2" to 12" Table Narrow 14" to 16" Table Wide)
» API 609 (2" to 12" Category A Table 2 14" to 16" Category B Table 3)

Body strength
» DIN/ EN 12516 T2 (DIN 3840)
» tested within the scope of the inspection body designate by Module H1

Operating pressure
» DN 50/2" - 400/16": 10 bar (depending on operating temperature)

Testing
» EN 12266 P10
» EN 12266 P11
» EN 12266 P12 Leak rate A

Bodies
» Wafer and Lug design with long neck for insulation

Vacuum
» up to 1 mbar absolute (depending on operating temperature)

Temperature range
» -40 °C up to +170 °C -40 °F up to +338 °F (depending on material)

Head flange
» EN ISO 5211
» NF E 29-402

Liner
» PTFE

STERILE-SEAL

No survival for bacteria

For fermentation, sterile processing is the premise to guarantee the optimum productivity of the used microorganisms. All bacteria have to be destroyed before fermentation and also all products fed into the process have to be sterilized. Most important is the avoidance of any contamination during fermentation up to the separation of the biomass and treatment of the final product.

The new re-designed STERILE-SEAL valve with its steam blocking chambers surround and protect the product area against external pollution, even under vacuum conditions. This design is a major breakthrough for large scale biotechnology plants. With the STERILE-SEAL valve bacteria contamination is a thing of the past.

Construction
The media in the inner chamber is protected against contamination by the surrounding isolation chambers which are directly connected to the inner sealing system. A second outer sealing system separates the process from the atmosphere. STERILE-SEAL valves are completely void and cavity-free to prevent any build-up of nutrients.

Operation Principle
Pressurized steam is fed into the steam inlet and distributed through the longitudinal channels of the shaft and out through the flow control at the bottom of the valve body. It is also possible to seal the valve by pressuring the isolation chambers and closing the steam outlet connection.

Sterilization Proof
During tests, STERILE-SEAL valves were contaminated at several points with Bacillus Stearothermophilus with a population of $5{,}7 \times 10^5$. Pressurized steam was then allowed to flow through the two chambers, followed by sterile air. In every instance the bacillus was completely destroyed.

The safe concept
STERILE-SEAL valves meet the highest standards of Garlock's excellence.

For example:

Body
Split-body, manufactured from ductile iron, cast steel or stainless steel. Safety sealing between the two body halves, seals are fitted within the body liner to prevent atmospheric contamination and the escape of media.

Body liner manufactured from high density PTFE, FDA approved, void-free, impermeable, liner thickness 3 mm minimum.

Stainless steel disc
For highest demands, i.e. pyrogenic resistant, particle and fibrous free surfaces with max. 1 % delta-ferrite, content:
Forged (WN 1.4435 and others).
Surface finishes to 0,1 µm Ra are available.

Shaft
One-piece manufactured from stainless steel with ring and longitudinal channels.

Advantages
The STERILE-SEAL concept improves the profitability of production processes in pharmaceutical, food and biotechnology industries.

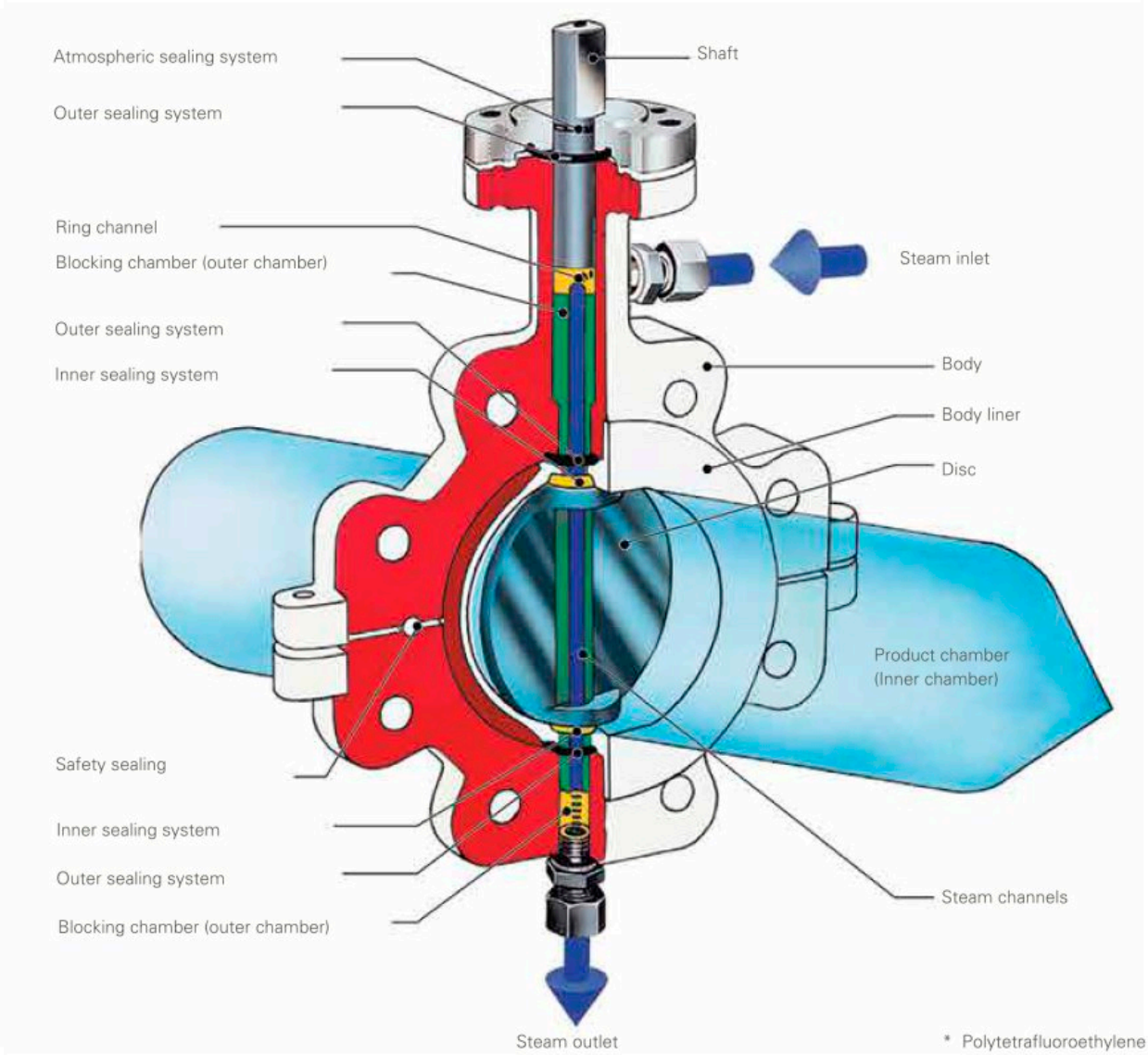
» Safety against contamination
» Safety against corrosion
» Safety of the body against over-pressurization
» Safety by standardization
» Safety against leakages
» Safety by identification

STERILE-SEAL

2-chamber-system guarantees production safety

PTFE*, isostatically molded. High density, high crystallinity, stainless steel discs. STERILE-SEAL valves are available in wafer and lug design in all sizes from 2" (DN 50) to 16" (DN 400). Actuators of any kind and type can be mounted.

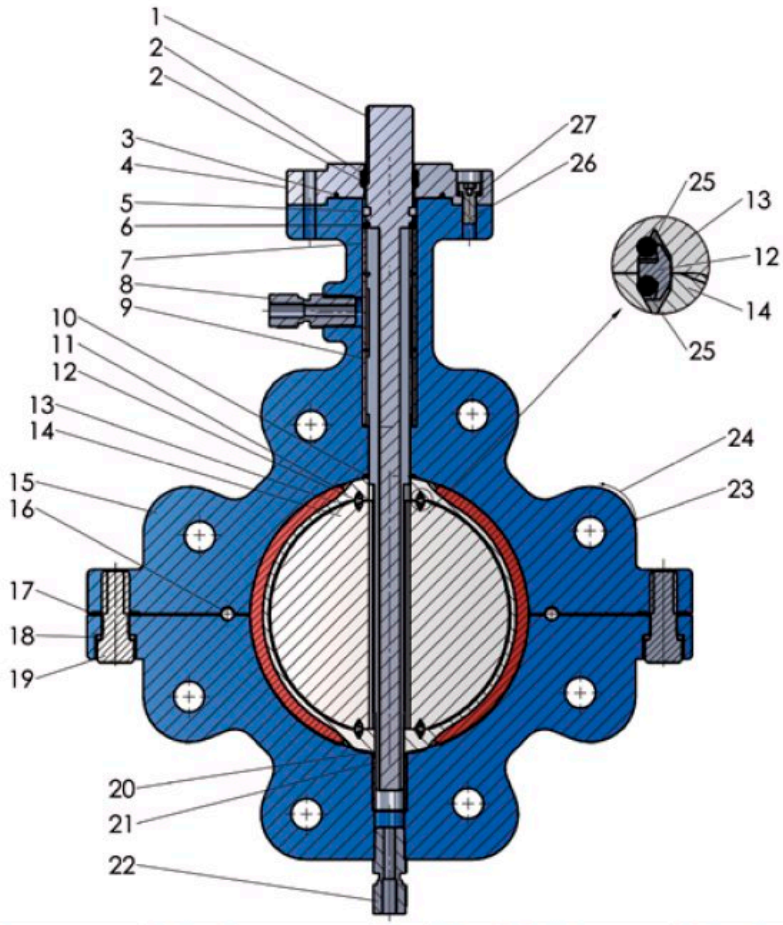
Service pressure:	from vacuum up to 10 bar
Service temperature:	-40 °C to +170 °C , 40 °F to 338 °F



* Polytetrafluoroethylene

STERILE-SEAL

Materials



Pos.	Qty.	Material	Designation
1	1	1.4313 up to DN 300 1.4021 from DN 350	Shaft
2	2[4]	EPDM	O-Ring (shaft)
3	1[4]	EPDM	O-Ring (top flange)
4	1	1.4301	Top flange
5	1	PTFE, carbon reinf.	Setaining ring (split)
6	1[4]	EPDM	O-Ring (shaft)
7	1	Steel/PTFE	Slide bearing (top)
8	1	Stainless steel	Fitting
9	2	Steel/PTFE	Slide bearing (center)
10	1[4]	EPDM	O-Ring (liner)
11	2[4]	EPDM	Elastomer backup element
12	2	PTFE	Sealring
13	1	see material table	Liner
14	1	see material table	Valve disc

Pos.	Qty.	Material	Designation
15	1	see material table	Body
16	2	PTFE	Security element
17	2[2]	PTFE	Washer
18	2[2]	Stainless steel	Spring washer
19	2[2]	Stainless steel	Body screw
20	1[4]	EPDM	O-Ring (liner)
21	1	Steel/PTFE	Slide bearing (bottom)
22	1	Stainless steel	Fitting
23	4	Stainless steel	Groove pin
24	1	Stainless steel	Nameplate
25	4[4]	EPDM	O-Ring (Sealring)
26	4	Stainless steel	Locking screw
27	4	Stainless steel	Spring washer

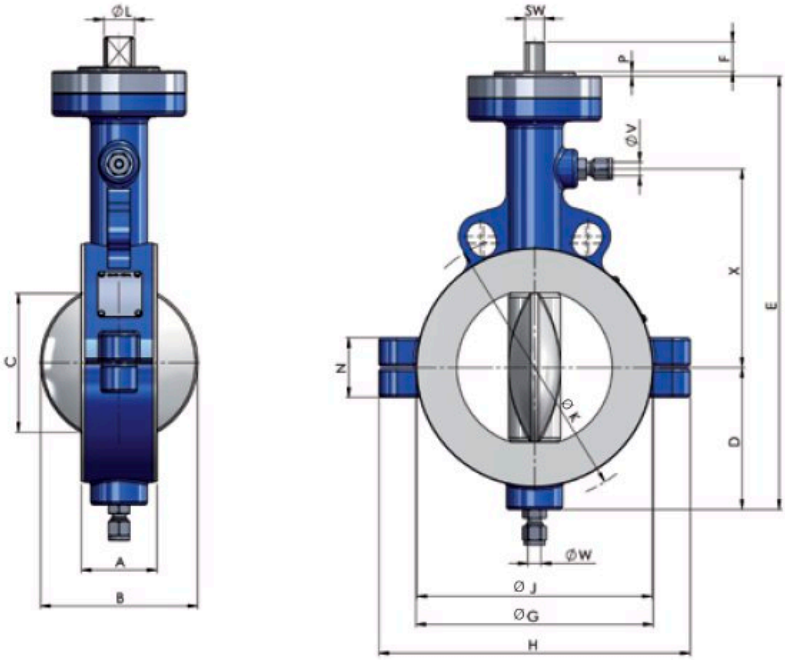
[2] > DN 350 – 4 pieces each
[4] other materials on request

STERILE-SEAL

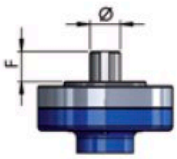
Dimension, Wafer

Flange connection:	EN 1092 (DIN 2501), PN 10 • PN 16 • ANSI B 16.5,150 LBS
Overall length:	EN 558-1 GR20 (DIN 3202 T3 K1)
Head flange:	EN ISO 5211

DN 50 - 300
2" - 12"



DN 350 - 400
14" - 16"



DN Inch	DN mm	Head flange **	A	B	C	D	E	F	Ø G	H	Ø J	K EN PN10	K ASME 150lbs	Ø L	SW Ø	P	N	ØV	ØW	Z EN PN10	Z ASME 150 lbs	X	Weight kg ***
2	50	F05	43	60	43	62	214	35	102	152	98	125	121	65	10,0	3	40	10	10	4xM16	4x5/8"-11	103	3,0
2 ½	65	F05	46	70	53	70	232	35	121	181	120	145	140	65	10,0	3	40	12	12	4xM16	4x5/8"-11	113	4,1
3	80	F05	46	82	67	79	256	35	133	183	127	160	152	65	10,0	3	40	12	12	8xM16	4x5/8"-11	128	4,5
4	100	F07	52	106	93	95	290	35	162	214	159	180	190	90	13,0	3	50	12	12	8xM16	8x5/8"-11	133	7,0
5	125	F07	56	128	115	108	318	35	192	248	187	210	216	90	13,0	3	50	12	12	8xM16	8x3/4"-10	148	9,5
6	150	F10	56	157	147	121	351	40	218	290	216	240	241	125	17,0	3	56	12	12	8xM20	8x3/4"-10	168	12,9
8	200	F10	60	197	188	150	410	40	273	350	270	295	298	125	17,0	3	56	12	12	8xM20	8x3/4"-10	198	18,1
10	250	F12	68	246	236	179	474	50	328	405	324	350	362	150	22,0	3	60	18	18	12xM20	12x7/8"-9	228	29,7
12	300	F12	78	295	284	216	551	50	378	455	375	400	432	150	22,0	3	70	18	18	12xM20	12x7/8"-9	258	38,6
14	350	F14	92*	335	322	265	670	60	438	550	413	460	476	175	44,4	4	70	25	25	16xM20	12x1"-8	314	77,2
16	400	F14	102	387	374	305	755	60	489	570	470	515	540	175	44,4	4	70	25	25	16xM24	16x1"-8	359	94,9
8	200	for PN 16 > DN 150										295								12xM20			
10	250											355								12xM24			
12	300											410								12xM24			

*GR 25 ** EN ISO 5211; all dimensions in millimeters (mm), if not indicated differently

*** Weight for version 111-S-W

Garlock
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Leaders in Sealing Integrity

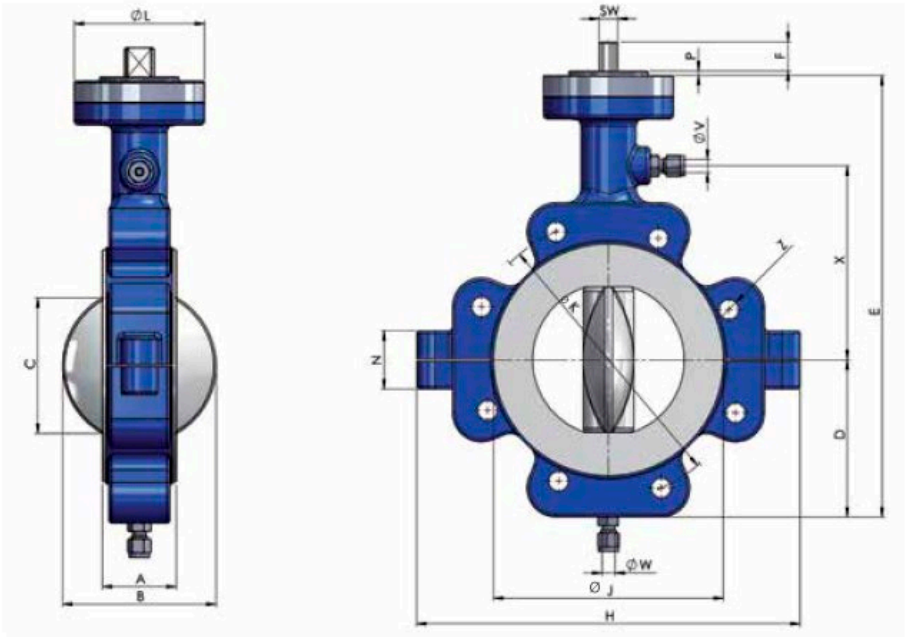
Garlock Butterfly Valves: Trusted throughout chemical, petrochemical and many other industries

STERILE-SEAL

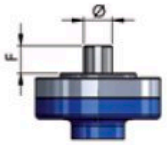
Dimension, Lug

Flange connection:	EN 1092 (DIN 2501), PN 10 • PN 16 • ANSI B 16.5,150 LBS
Overall length:	EN 558-1 GR20 (DIN 3202 T3 K1)
Head flange:	EN ISO 5211

DN 50 - 300
2" - 12"



DN 350 - 400
14" - 16"



DN Inch	DN mm	Head flange **	A	B	C	D	E	F	H	Ø J	Ø K EN PN10	Ø K ASME 150 lbs	Ø L	SW Ø	P	N	ØV	ØW	Z EN PN10	Z ASME 150 lbs	X	Weight kg ***
2	50	F05	43	60	43	62	214	35	170	98	125	121	65	10,0	3	45	10	10	4xM16	4x5/8"-11	103	3,8
2 ½	65	F05	46	70	53	70	232	35	193	120	145	140	65	10,0	3	45	12	12	4xM16	4x5/8"-11	113	4,8
3	80	F05	46	82	67	79	256	35	252	193	160	152	65	10,0	3	56	12	12	8xM16	4x5/8"-11	128	7,0
4	100	F07	52	106	93	95	290	35	290	252	180	190	90	13,0	3	56	12	12	8xM16	8x5/8"-11	133	11,1
5	125	F07	56	128	115	108	318	35	312	187	210	216	90	13,0	3	60	12	12	8xM16	8x3/4"-10	148	13,5
6	150	F10	56	157	147	121	351	40	362	216	240	241	125	17,0	3	66	12	12	8xM20	8x3/4"-10	168	17,8
8	200	F10	60	197	188	150	410	40	416	270	295	298	125	17,0	3	76	12	12	8xM20	8x3/4"-10	198	24,1
10	250	F12	68	246	236	179	474	50	508	324	350	362	150	22,0	3	90	18	18	12xM20	12x7/8"-9	228	39,4
12	300	F12	78	295	284	234	551	50	575	375	400	432	150	22,0	3	110	18	18	12xM20	12x7/8"-9	258	55,0
14	350	F14	92*	335	322	265	670	60	640	413	460	476	175	44,4	4	70	25	25	16xM20	12x1"-8	314	108,2
16	400	F14	102	387	374	305	755	60	720	470	515	540	175	44,4	4	79	25	25	16xM24	16x1"-8	359	137,4
8	200	for PN 16 > DN 150									295								12xM20			
10	250										355								12xM24			
12	300										410								12xM24			

*GR 25 ** EN ISO 5211; all dimensions in millimeters (mm), if not indicated differently

*** Weight for version 111-S-L

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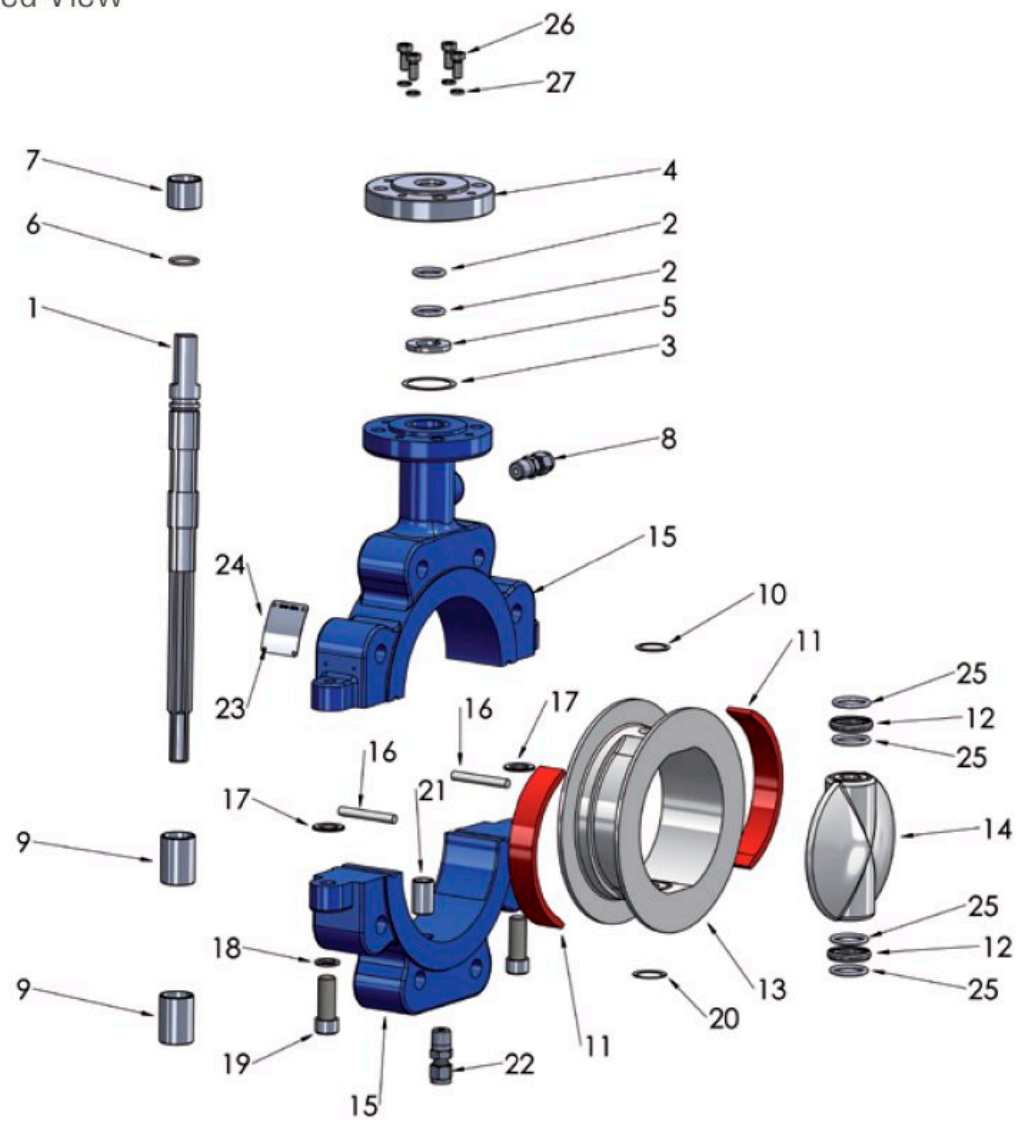
STERILE-SEAL

Exploded View



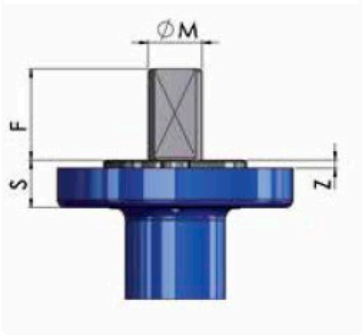
Pos.	Designation	Pos.	Designation	Pos.	Designation	Pos.	Designation
1	Shaft	8	Fitting	15	Body	22	Fitting
2	O-Ring (shaft)	9	Slide bearing (center)	16	Security element	23	Groove pin
3	O-Ring (top flange)	10	O-Ring (liner)	17	Washer	24	Name plate
4	Top flange	11	Elastomer back-up	18	Spring washer	25	O-Ring (Sealring)
5	Retaining ring (split)	12	Seal ring	19	Body screw	26	Locking screw
6	O-Ring (shaft)	13	Liner	20	O-ring (liner)	27	Spring washer
7	Slide bearing (top)	14	Disc	21	Slide bearing (bottom)		

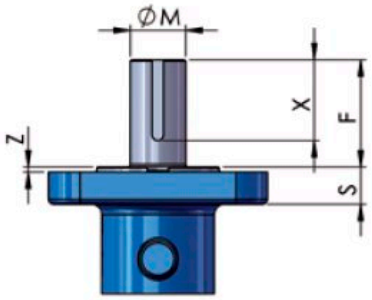
Head flange

Dimensions

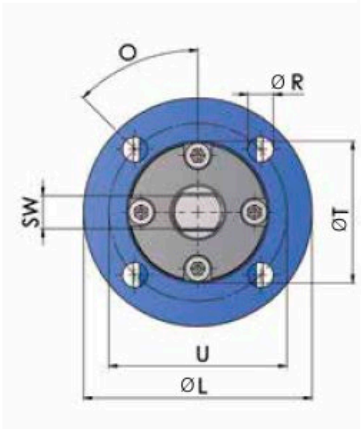
According to EN ISO 5211

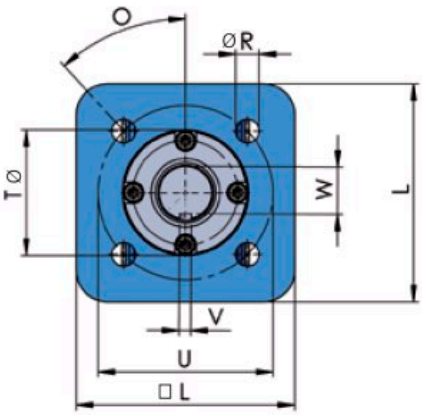
DN 50 - 300
2" - 12"





DN 350 - 600
12" - 24"





DN Inch	DN mm	Head flange *	F	SW	Ø L □L	Ø M	O	n x Ø R	S**	S***	U	ØT	Z	V	W	X
2, 2 ½, 3	50, 65, 80	F05	35	10	65	14,2	45°	4 x 7	15	27	50	35	3	-	-	-
4, 5	100, 125	F07	35	13	90	20,5	45°	4 x 9	18	33	70	55	3	-	-	-
6, 8	150, 200	F10	40	17	125	25,3	45°	4 x 11	18	33	102	70	3	-	-	-
10, 12	250, 300	F12	50	22	150	32,4	45°	4 x 13	21	36	125	85	3	-	-	-
14, 16	350, 400	F14	60	-	175	44,4	45°	4 x 17	34	64	140	100	4	9,5	39	55
18, 20	450, 500	F16	80	-	210	44,4	45°	4 x 22	44	-	165	130	4	9,5	39	55
24	600	F25	90	-	300	63,5	22,5°	8 x 17	60	-	254	200	5	16,0	54	70

* EN ISO 5211

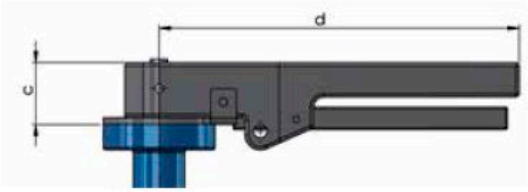
** GAR-SEAL, SAFETY-SEAL, MOBILE-SEAL

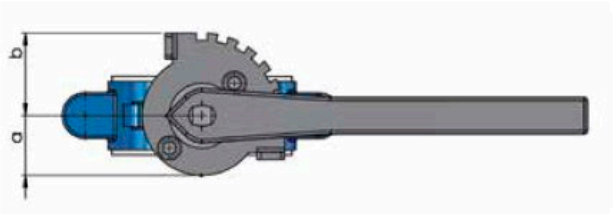
*** STERILE-SEAL

all dimensions in millimeters (mm), if not indicated differently

Manual Operators

Hand-Lever



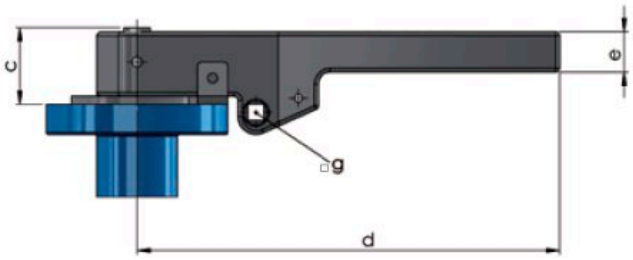


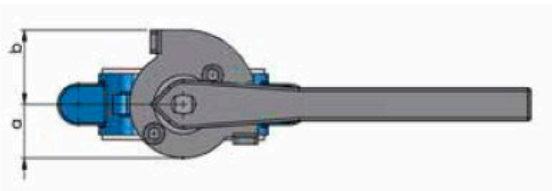
DN Inch	DN mm	a	b	c	d	Weight kg
2, 2 ½, 3	50, 65, 80	32,5	45	38	210	1,0
4, 5	100, 125	45	57	38	300	1,5
6, 8	150, 200	80	80	43	500	3,5

all dimensions in millimeters (mm), if not indicated differently

ADR-Hand-Lever

ADR Locking handle for hazardous transports



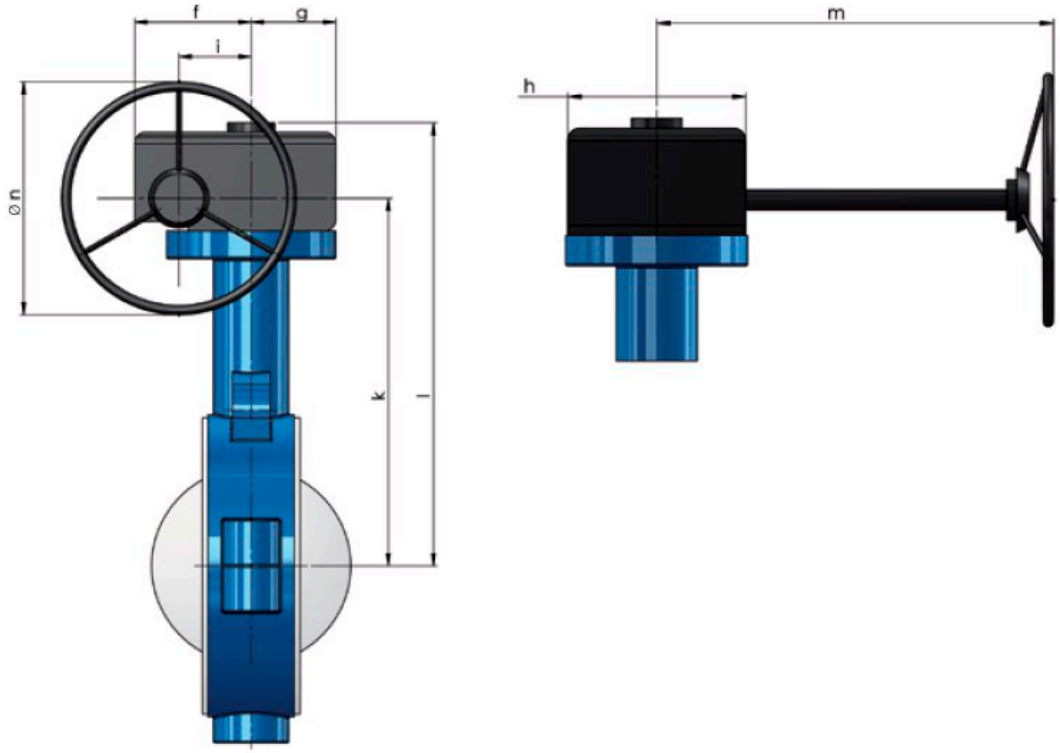


DN Inch	DN mm	a	b	c	d	e	□g	Weight kg
2, 2½, 3	50, 65, 80	32,5	45	38	210	20	8	0,9
4, 5	100, 125	45	57	38	300	20	8	1,2
6, 8	150, 200	80	80	43	500	26	8	3,1

all dimensions in millimeters (mm), if not indicated differently

Manual Operators

Gear Operator



DN Inch	DN mm	f	g	h	i	k*	l*	k**	l**	m	Ø n	Total weight (kg) Type W Wafer	Total weight (kg) Type L Lug
2	50	62	45	88	38,5	166,5	198	179,5	210	152	125	6,6	7,4
2 ½	65	62	45	88	38,5	167,5	208	180,5	220	152	125	7,6	8,3
3	80	62	45	88	38,5	191,5	223	203,5	230	152	125	8,0	10,5
4	100	62	45	88	38,5	206,5	238	221,5	253	152	125	10,1	14,2
5	125	62	45	88	38,5	221,5	253	236,5	268	152	125	12,6	16,6
6	150	83,5	58	116	52	250	282	265	297	182	250	18,0	22,9
8	200	83,5	58	116	52	280	312	295	327	182	250	23,2	29,2
10	250	105	75	150	66,7	322	361	337	376	216	300	38,2	47,9
12	300	105	75	150	66,7	362	401	377	416	216	300	47,1	63,5
14	350	131	86	198	89,5	425	468	455	498	283	450	89,0	120,0
16	400	131	86	198	89,5	470	513	500	543	283	450	106,7	149,2
18	450	178	114	252	123	510	566	-	-	335	450	152,4	180,9
20	500	178	114	252	123	560	611	-	-	335	450	184,3	274,8
24	600	209	117	315	154	625	702	-	-	360	450	289,2	427,7

* GAR-SEAL, SAFETY-SEAL, MOBILE-SEAL

** STERILE-SEAL

all dimensions in millimeters (mm), if not indicated differently

Technical Details

Standard Design

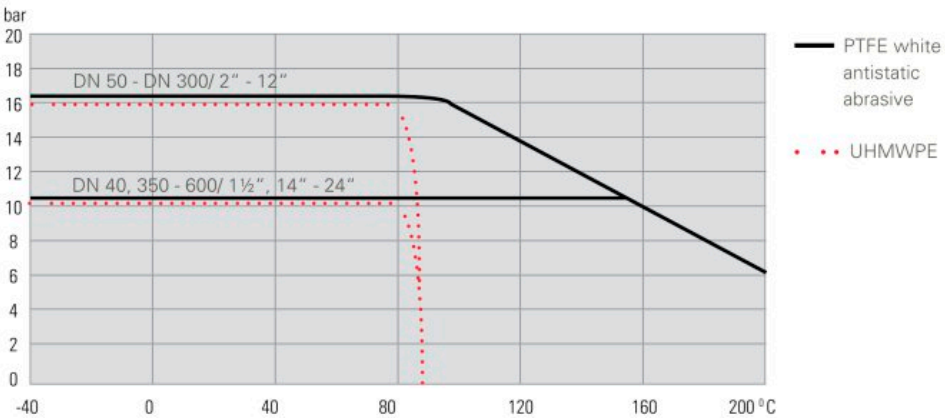
For selecting the correct valve actuation the values below represent the maximum torques for the opening and closing action. The torques shown in the table are valid for disc and liner made of the same material: PTFE, antistatic or abrasive. For torque tables for other materials or other material combinations please consult our valves specialists. The stated torques are including a 10 % safety factor at dry condition measured at 21 °C (70 °F).

Torques in Nm

Dimensions / Material		Liner*	PTFE/ antistatic/ abrasive
		Disc	PTFE/ antistatic/ abrasive
Inch	mm	Nm	
2	50	25	
2½	65	28	
3	80	29	
4	100	53	
5	125	87	
6	150	121	
8	200	168	
10	250	215	
12	300	274	
14	350	544	
16	400	770	
18	450	996	
20	500	1089	
24	600	2056	

*3 mm liner up to DN 300 / 12"
4 mm liner from DN 350 / 14"

P x T - Diagram GAR-SEAL Butterfly Valve

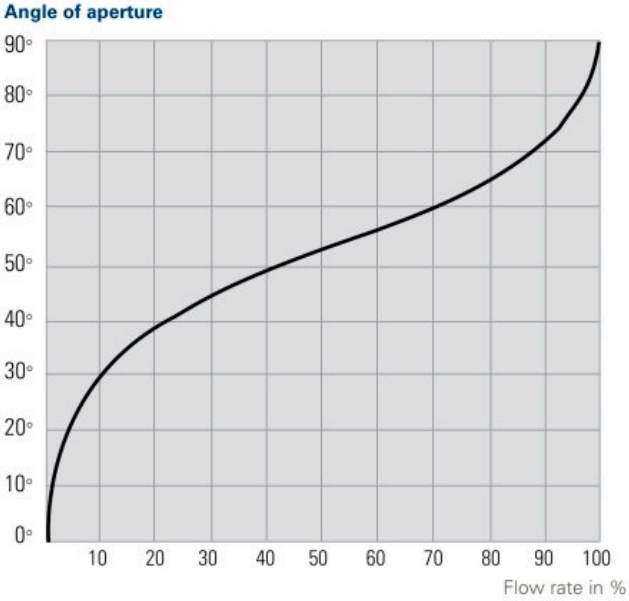


Technical Details

Standard Design

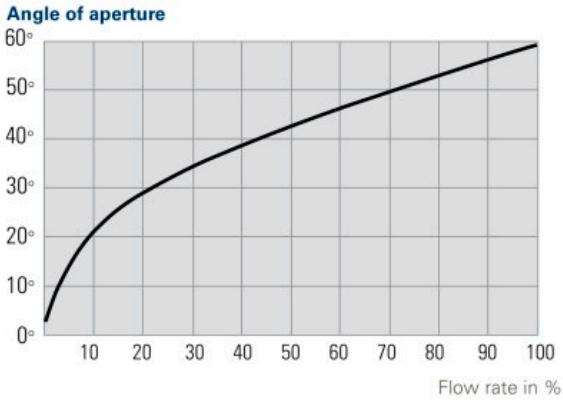
Open/Close control – characteristic curve

The graph shows the percentage flow rate, depending upon the disc-aperture. The curve reflects a throttle valve of any size with slight modifications depending upon thickness and profile of the disc itself. Throttle valves with apertures above 60° should be used for on/off control only.



Continuous control / characteristic curve

For continuous control of a throttle valve the flow rate for a 60° aperture is defined with 100 % to provide a flow reserve. The graph has a characteristic of similar percentage for disc opening from 0° to 60°.



Flow Rate

For liquids the following references apply:
Constant control: 4,5 m/s
Open/Close control: 7,5 m/s

For GAR-SEAL Butterfly Valves with UHMWPE-Lining the maximum flow rate is limited to 3,5 m/s.

Nominal bore		kv-factor against the angle of aperture							
Inch	mm	20°	30°	40°	50°	60°	70°	80°	90°
2	50	1	13	25	37	54	69	81	84
2 ½	65	2	16	34	52	82	112	130	132
3	80	2	16	38	80	133	191	243	244
4	100	9	43	87	144	228	316	399	420
5	125	16	61	122	210	262	497	670	710
6	150	22	113	215	364	547	822	972	997
8	200	35	165	332	555	874	1215	1534	1613
10	250	65	301	608	1015	1599	2221	2805	2950
12	300	96	446	900	1504	2369	3291	4157	4371
14	350	136	632	1277	2133	3360	4669	5896	6200
16	400	194	898	1813	3027	4770	6626	8369	8800
18	450	237	1097	2215	3698	5824	8095	10223	10750
20	500	297	1377	2781	4644	7317	10166	12839	13500
24	600	420	1948	3935	6570	10352	14382	18164	19100

kv-values against the angle of aperture

The kv-factor reflects the flow of water (density 1=1000 kg/m³) in m³/h for a pressure gradient of Δ p= 1 bar. The resistance characteristic of the butterfly valve is subject to the kv-factor. It replaces all earlier definitions, see cross-section, flow and friction coefficient. A detailed butterfly valve dimensioning for maximum flow and/or for throttle use is performed by CONVAL-Software programming.

Please consult Garlock directly.

Technical Details

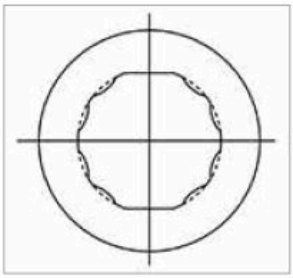
Special vacuum design

Garlock valves have for decades operated under extreme vacuum conditions.

Past statements on vacuum stress have been made and documented, but only at ambient temperature and the valve closed. This is very ambiguous to a plant engineer. His requirements are the actual vacuum data at all temperatures. Plant vacuum can go down to 1 mbar together with higher temperatures. This often leads to leakages and malfunctions as the liner can deformed. Garlock has developed special vacuum versions of its GAR-SEAL valves to meet these particular demands.

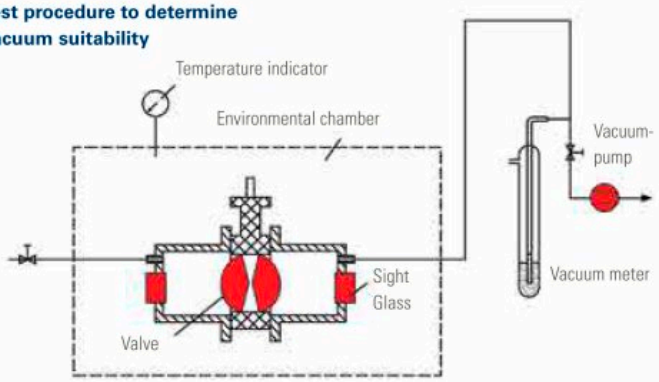
Vacuum applications of fluorocarbon lined valves with separate liners are subject to special parameters. Therefore not only the actual vacuum is important, but also the service temperature, the thickness of the liner and its geometry.

Garlock with its successful development program and substantial testing of various sizes, including DN 500, at temperatures up to 200 °C concluded that such extreme service conditions can be handled.



Typical appearance of high vacuum-loaded Body Liner

Test procedure to determine vacuum suitability



Temperature range: - 35 °C to +200 °C
Temperature increments: Δt: 15 °C

GAR-SEAL Valves can be supplied with varying liner thicknesses for vacuum duties.

The DN 100 size liners show the difference between the standard 3 mm thick and the vacuum 5 mm thick liners. The liner thickness substantially improves the performance against high vacuum stress.

In the DN 100 valve the 3 mm thick liner will operate to 1 mbar, while the 5 mm liner operates below 1 mbar vacuum. Depending on the operating vacuum and temperature and size of valve, the liner thickness can be calculated and selected between 3 mm and 10 mm for GAR-SEAL valves.

Please contact Garlock directly for your specific requirements on vacuum applications.

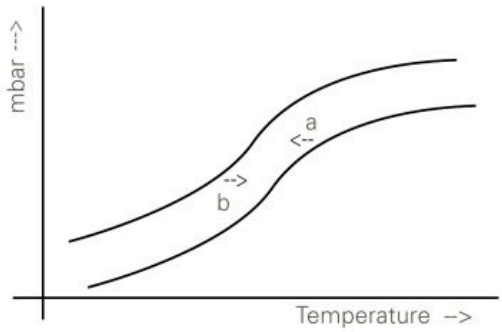
3 mm standard liner

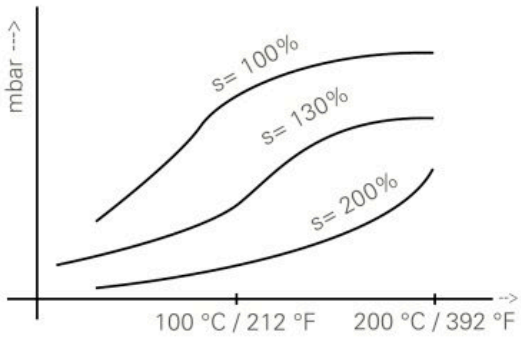
5 mm vacuum liner

Technical Details

Data and facts for vacuum design

Facts and figures for the use with vacuum





Typical characteristics of body liners under vacuum stress depending on temperature

a) Increase size and/or decrease liner thickness DN 1 > DN 2; s1 < s2

b) Increasing liner thickness and/or higher moment of resistance by altering geometry s2 > s1

Recommended application limits for GAR-SEAL valves with standard body liners

For applications in vacuum and/or temperatures above these values special body liners are necessary. Please contact Garlock directly.

Stress example of Garlock DN 300 body liner with same geometry but different liner thickness "s"

A 30% increase of the liner thickness at a service temperature of 160 °C improves the vacuum resistance by 35 %. A doubling of the lining thickness will lead to a 85 % increase in the vacuum resistance.

Nominal width	Temperature range	Standard liner *	Maximum vacuum liner *
≤ DN 100	≤ 100 °C/ 212 °F	1	< 1
	> 100 °C/ 212 °F ≤ 150 °C/ 302 °F	1	< 1
	> 150 °C/ 302 °F ≤ 200 °C/ 392 °F	1	< 1
DN 150	≤ 100 °C/ 212 °F	5	< 1
	> 100 °C/ 212 °F ≤ 150 °C/ 302 °F	173	1
	> 150 °C/ 302 °F ≤ 200 °C/ 392 °F	293	1
DN 200	≤ 100 °C/ 212 °F	209	< 1
	> 100 °C/ 212 °F ≤ 150 °C/ 302 °F	343	< 1
	> 150 °C/ 302 °F ≤ 200 °C/ 392 °F	438	1
DN 300	≤ 100 °C/ 212 °F	471	1
	> 100 °C/ 212 °F ≤ 150 °C/ 302 °F	561	39
	> 150 °C/ 302 °F ≤ 200 °C/ 392 °F	624	178
DN 400	≤ 100 °C/ 212 °F	498	1
	> 100 °C/ 212 °F ≤ 150 °C/ 302 °F	583	1
	> 150 °C/ 302 °F ≤ 200 °C/ 392 °F	643	108
DN 500	≤ 100 °C/ 212 °F	599	162
	> 100 °C/ 212 °F ≤ 150 °C/ 302 °F	667	304
	> 150 °C/ 302 °F ≤ 200 °C/ 392 °F	715	405
DN 600	≤ 100 °C/ 212 °F	737	343
	> 100 °C/ 212 °F ≤ 150 °C/ 302 °F	782	454
	> 150 °C/ 302 °F ≤ 200 °C/ 392 °F	813	533

* all data in mbar (absolute)

Garlock
an EnPro Industries family of companies

Leaders in Sealing Integrity

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Garlock Sealing Technologies
GPT
Garlock PTY
Garlock India Private Limited

Garlock de Canada, LTD
Garlock China
Garlock Singapore
Garlock USA

Garlock de Mexico, S.A. De C.V.
Garlock New Zealand
Garlock Great Britain Limited
Garlock Middle East

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Garlock
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Seals & Sealing Systems

Overview and Capabilities

Europe, Middle East and Africa

Leaders in Sealing Integrity

Table of Contents

With locations throughout the globe, we are always close to you

Garlock is acknowledged as the global leader in high-performance fluid sealing products, committed to a culture of safety by making the world safer, sustainable and more reliable.

Garlock, part of EnPro Industries Inc., is one of the leading companies in the field of high performance sealing technology and is considered to be a specialist for sealing critical, demanding media in innovative machine, engineering and construction and in the process industry. With an integrated spectrum of services, Garlock supports a wide variety of industries. Garlock offers the best possible individualized technical consultancy and industry specific engineering competence in designing, producing, supplying and commissioning its sealing products. The main goal is always to ensure failsafe, sustainable and environmentally compatible machine and plant operation. The product portfolio covers cut gaskets made of modified PTFE and fiber materials, shaft seals, bearing isolators, diaphragms, metallic gaskets, compression packing, hydraulic seals, graphite seals and valves. As well as standard seals, Garlock primarily develops and produces special solutions for customer specific applications. These seals are used in such industries as machine and plant engineering and construction, pharma and food, conventional and alternative power generation, steel and aluminum, paper, mining, marine and oil and gas. Garlock also has its own research and development facilities which can also be called upon for in-depth examinations and analyses within the scope of customer support. Roughly 1500 employees work for the company at 22 locations. Garlock is represented in more than 90 other countries through distribution partners and specialist dealers.

Milestones

- » 1887 Olin J. Garlock founds Garlock
- » 1923 CHEVRON®-Set for locomotive steam cylinders and piston introduced
- » 1928 KLOZURE®, the first ever synthetic rubber shaft seal is introduced
- » 1967 The GYLON® family is introduced
- » 1979 BLUE-GARD® is introduced, the world´s first asbestos-free fiber flat seal
- » 2007 GYLON BIO-PRO® is introduced
- » 2011 Introduction of the labyrinth SGi™
- » 2012 Centralization of the global production of GAR-SEAL valves at the facility in Neuss, Germany
- » 2016 Introduction of GYLON BIO-PRO® PLUS
- » 2017 Introduction of PS-SEAL® with GYLON® STYLE 3549
- » 2018 Introduction of GYLON® EPIX

Facts & Figures

- » Industry: Sealing technology
- » Products: Seals for static and dynamic applications and valves, such as shaft seals, labyrinth seals, stuffing box packaging, cut gaskets, graphite seals and valve
- » Market position: Leader for sealing solutions for critical and complex machine and plant construction as well as in the process industry
- » Employees: 1500 worldwide

Garlock
an EnPro Industries family of companies

Leaders in Sealing Integrity

Industries Served

Providing personal safety and industry reassurance

Power Generation

Garlock companies offer advanced sealing solutions for the varied needs of power generation industries, such as coal, natural gas, fossil fuel, gas turbines and more.

POWER GENERATION

Mining

Garlock sealing products are built for heavy-duty performance and reliability in even the most formidable conditions. They are designed and constructed for superior erosion and corrosion resistance.

MINING

Primary Metals

When down time is not an option, the Garlock family of companies provides sealing products that focus on the extreme requirements of the metals industry.

PRIMARY METALS

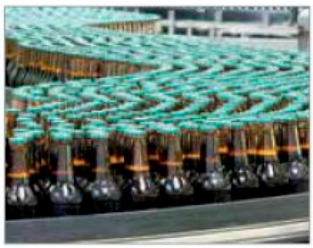
Chemical Processing

Sealing products from the Garlock family of companies provide safety and reassurance like no others, each able to withstand temperature extremes and resist corrosion due to contact with aggressive materials.

CHEMICAL PROCESSING

Food & Beverage

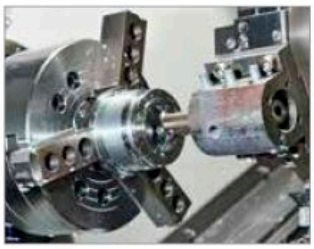
We manufacture sealing solutions with the specific needs of the food and beverage markets at the forefront.



FOOD & BEVERAGE, BREWING & BOTTLING

OEM

Garlock supports machine manufacturers in their development of new products with customized engineering, and supplies reliable sealing solutions for the following series production. Therefore Garlock also supports the sustainability initiative "Blue Competence" of the VDMA.



ORIGINAL EQUIPMENT MANUFACTURING (OEM)

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Leaders in Sealing Integrity

Industries Served

Providing personal safety and industry reassurance

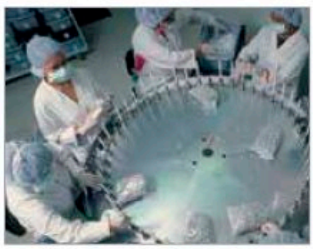
Oil & Gas

Garlock programs for the Oil & Gas industry include solutions for on-site maintenance, turnkey emission monitoring and repair programs, Integrated Pollution Prevention Control reporting, comprehensive plant sealing, specialty projects and low emissions.

OIL & GAS

Pharmaceutical

The Garlock family of companies continues to seek out and work with operations and maintenance staff, as well as process engineers to develop sealing solutions in static and dynamic applications common to the pharmaceutical industry, including hygienic pipework, blenders and mixers, fluid bed dryers, valves and pumps.



PHARMACEUTICAL

Pulp & Paper

Reduced downtime and increased efficiency are at the top of every manufacturer's priority list, especially those in the Pulp & Paper industry. Also critical on that list are reducing water consumption and minimizing environmental impact in a cost-effective manner. The Garlock family of companies offers solutions for all of those challenges and more.

PULP & PAPER

Nuclear

Health and safety outweigh all other factors in nuclear plants. Therefore, failure is never an option when it comes to the sealing products used in these plants.

NUCLEAR

Water/Waste Water

Once a commodity, fresh water is now recognized as one of the most valuable resources we have on earth. Garlock companies offer sealing solutions that help meet these stringent requirements, as well as withstand the strenuous demands of various processes.

WATER/WASTE WATER

Training

In terms of storage, handling and assembly of sealing systems competent staff at the user side is of increasing importance. To meet these demands Garlock offers a variety of training courses that are tailored to the end user.

TRAINING

Product Overview

Offering a wide range of sealing solutions

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Butterf Valves

GAR-SEAL 

MOBILE-SE 

SAFETY-SE 

STERILE-SE 

Garlock Act 

Mounting S 

Garlock
an EnPro Industries family of companies

Leaders in Se

Modified PTFE Gaskets

Offering a complete range of gasket materials that comply with the most stringent environmental regulations.

Standard Material

The first choice for universal applications in the chemical and petrochemical industries.

Blue Material

The product is compliant with FDA, EC1935/2004 including EC 10/2011 and softener as well as ADI free, excellent for the Food& Pharma industry and others. Highly compressible through the well controlled and uniform process of aluminosilcate microspheres filler distribution.

White Material

The product with the broadest chemical resistance. The preferred choice for extremely aggressive media including hydrofluoric acid, aluminum fluorides, chlorine/alkali, caustic potash solution and electroplating.

GYLON® Legacy

GYLON® STANDARD STYLE 3501-E

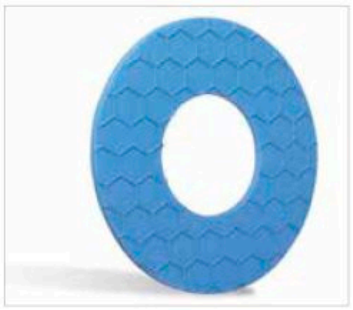
GYLON® BLUE STYLE 3504

GYLON® WHITE STYLE 3510

Our legacy GYLON® far exceeds the performance of conventional PTFE in the combination of high pressure/temperature (PxT) and minimal coldflow. It has an excellent dimensional stability under thermal stress

GYLON® EPIX

GYLON® EPIX STANDARD STYLE 3501-E EPX



GYLON® EPIX BLUE STYLE 3504 EPX

GYLON® EPIX WHITE STYLE 3510 EPX

Produced with the same proven compounds of traditional GYLON® with the same chemical resistance and certificates and declarations like EC 1935/2004, USP class VI, silicone-free, ADI-free and softener free. The superior characteristics in sealability, minimum required surface pressure and maximum tolerated surface pressure are enabled by the structured surface. The new GYLON® EPIX brings PTFE gasketing to a next level. While replacing all current gaskets of 1.6 to 3.2 mm thickness it will outperform all other PTFE gasketing products in the market.

Modified PTFE Gaskets

Our solutions are customized to your exact specifications.

Soft Material

Compressible layers conform to surface irregularities, especially on warped, pitted or scratched flanges. The rigid PTFE core reduces cold flow and creep normally associated with conventional PTFE gaskets.

GYLON® SOFT STYLE 3545

Joint Sealant Tape

Garlock Joint Sealant Tape, Style 3535 is made of 100 % pure mono-directionally expanded PTFE. It is a universal sealing solution on a spool, for large diameter flanges, which can instantly be formed in place to fit any shape regardless of it's complexity. The exceptional good capability to adapt to surfaces can compensate out-of parallel or damaged sealing surfaces with outstanding performance.

STYLE 3535

Multi Sealant Tape

Garlock Style Multi-ST, is a multi – directionally expanded PTFE sealant tape for metallic equipment and/or large flanges. As a form-in-place gasket on a spool it can be installed quickly, reducing expensive downtime. The multi-directionally orientated fiber structure offers great creep resistance and sealability even under fluctuating temperatures and pressures.

STYLE MULTI-ST

Modified PTFE Gaskets

Quality PTFE seals for the pharmaceutical and food processing industries

GYLON BIO-PRO®

GYLON BIO-PRO® seals offer a safe solution with its modified and restructured PTFE material, pre-formed and stress controlled, for all TRI-CLAMP standards. It is dimensionally stable and resists intrusion into the pipe bore. Can be safely used with all cleaning, neutralizing and sterilizing media, including steam, and for all standard process temperatures.

GYLON BIO-PRO®

GYLON BIO-ECO®

The necessity for adequate sealing stress and simultaneous recovery makes GYLON BIO-ECO® the ideal solution for couplings in accordance with DIN 11851 and SMS1149. All of the disadvantages associated with current elastomeric seals regarding temperature, chemical resistance and re-usability are eliminated by the modified PTFE material.

GYLON BIO-ECO®

GYLON BIO-ASEPT®

GYLON BIO-ASEPT® seals offer high stability and a specific elasticity. The seals are pre-formed and stress controlled to provide a solid seal when assembled in the piping systems. Chemical degradation or brittleness will not occur under normal or even increasing process and sterilization conditions, due to specific, high performing PTFE sealing material.

GYLON BIO-ASEPT®

GYLON BIO-PRO® PLUS

GYLON BIO-PRO® PLUS is a high performance gasketing product made out of 100% pure PTFE with an excellent dimensional stability. Because of the excellent hygienic design of the gasket cleaning processes can be carried out effective and resource-efficient. Therefore it is especially suited for the Pharma- and Food industries

GYLON BIO-PRO® PLUS

GYLON BIO-LOK®

Camlock connections are the standard connection for quick coupling in the food industry as well as the chemical industry. GYLON BIO-LOK® is made of highly compressible and flexible material GYLON® Blue Style 3504. The seals offers a high stability and provides a solid seal when assembled.

GYLON BIO-LOK®

GARLOCK PRO-CLAMP

Garlock PRO-CLAMP is a sanitary high-pressure clamp for hygienic connections according to DIN EN 32676 and ASME BPE 2016. It provides and maintains a high and uniform load across the gasket at all times. It does not require re-torqueing and holds up the ideal sealing point at all times during the process preventing the accumulation of process media.

GARLOCK PRO-CLAMP

Diaphragms

Providing the highest performance PTFE and rubber solutions for your industrial and sanitary needs.

GYLON® Style 3522

Exclusive to Garlock, this time proven product is made using a proprietary process which optimizes quality and uniformity. Using the best available technology GYLON® PTFE diaphragms offer the longest cycle life in the industry, and continue to outperform all competitive materials.

GARLOCK ONE-UP®

Chemical resistance is the property that makes Garlock ONE-UP® pump diaphragms so versatile. Suitable for use with most chemicals and in elevated temperatures and pressures, these diaphragms are ideally suited for those general service pumps that are likely to be put to one use today and another use tomorrow.

GYLON® STYLE 3522

GARLOCK ONE-UP®

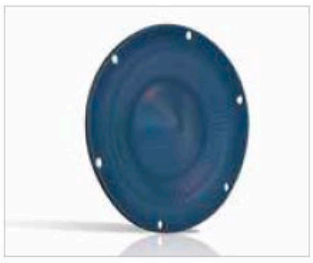
Rubber Diaphragms

The trusted solution for more reliable and longer lived pump and valve diaphragms. Offered in a variety of high performance rubber compounds; we also have the ability to design compounds to meet customer specific requirements.

GYLON ONE-UP®

Your solution for sanitary applications in air operated diaphragm pumps. For years the industrial ONE-UP® pump diaphragm has been the first choice for the most demanding industrial applications. We are now introducing the new GYLON® ONE-UP for the most demanding sanitary applications.

HIGH PERFORMANCE RUBBER DIAPHRAGMS



GYLON ONE-UP®

Garlock
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Leaders in Sealing Integrity

Gaskets & Sheets

Offering a complete range of gasket materials that comply with the most stringent environmental regulations.

BLUE-GARD®

Gasketing material made from a unique blend of fiber, fillers, and a choice of several elastomeric binders. Excels in a wide range of industrial applications.

BLUE-GARD®

Style 9900

Graphite fiber gasketing withstands extreme temperature and pressure, provides good chemical resistance and is fire safe. Handles and cuts more easily than exfoliated graphite sheet or metal-inserted gasket materials.

STYLE 9900

Style 9850

High Temperature Gasketing. Heat and oxidation resistance Carbon fiber gasketing excels in harshest conditions - intense heat, high pressure, saturated steam and hot oils.

STYLE 9850

Style IFG 5500

Inorganic fiber gasketing with excellent thermal stability and torque retention for optimal sealability in temperatures up to 290°C (550°F) continuous.

STYLE IFG 5500

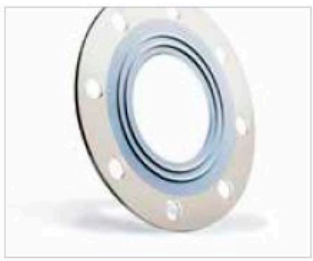
THERMa-PUR™

This unique new gasket material is designed for use in high temperature sealing applications, is able to withstand continuous and thermal cycling temperature up to 1,832ºF (1,000ºC). Its proprietary formulation is oxidation resistant, provides electrical insulation and has the ability to resist absorption of water and other liquids.

THERMa-PUR™ STYLE 4122

STRESS SAVER®

Super low torque gasket for non-metallic flanges in chemical and ultra-pure applications. Available in EPDM, EPDM with a PTFE envelope (jacket), and a proprietary fluoroelastomer for aggressive chemical service.



STRESS SAVER® STYLE 370

Garlock
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Leaders in Sealing Integrity

Metallic Gaskets

The Garlock Advantage

FLEXSEAL®

Made by winding alternating strips of metal and soft filler material such as flexible graphite or PTFE. Ideal for standard flanges, heat exchangers, boiler handholes, manholes and other high temperature, high pressure applications.

EDGE®

Innovative spiral wound gasket design, eliminates the radial buckling problems typical of traditional spiral wound gaskets.

GRAPHONIC®

Corrugated metal core encapsulated by soft sealing elements. Excellent for high temperatures and corrosive chemicals. Works well in less-than-perfect flanges and thermocycling applications.

FLEXSEAL® SPIRAL WOUND

EDGE®

GRAPHONIC®

Kammprofile™

Serrated solid metal core for rigidity coupled with a deformable sealing material for compressibility. Ensures tight, reliable sealing even under low bolt loads. Durable and tight in extreme temperature and pressure fluctuations.

Heat Exchanger Gaskets

Custom configurations available in a wide range of materials and gasket styles. Solutions for almost any application.

THERMa-PUR™

In addition to our existing line of THERMa-PUR offerings, we are now adding a high temperature THERMa-PUR Spiral Wound. The THERMa-PUR Spiral Wound gasket is designed for use in extreme temperature and aggressive chemical applications.

KAMMPROFILE™

HEAT EXCHANGER GASKETS

THERMa-PUR™ SPIRAL WOUND

Shaft Seals

PS-SEAL is a cost-efficient solution for many different demands in practical use. Among standardized seals the portfolio of Garlock products in this section also contains application specified seals.

PS-SEAL® Standard

PS-SEAL Standard is a Garlock shaft seal consisting of a stainless steel case, a GYLON® BLACK seal lip and a static sealing element made of FKM. 49 Standard dimensions can be delivered immediately.

PS-SEAL® Non-Standard

Garlock PS-SEAL Non-Standard are items in standard sizes, but with different configurations of their seal lips and made of different materials.

» Reverselip, Single + Dustlip
» Tandem, Back-to-Back
» Different lip materials and modifications of ID and width

PS-SEAL® Special

Due to the complex applications for high performance seals, Garlock offers sealing options with single and multiple lip assemblies. As far as practicable these seals are standardized to supply cost-efficient special solutions. The PS-SEAL Special is available in many different lip and housing materials.

PS-SEAL STANDARD

PS-SEAL NON-STANDARD, TANDEM

PS-SEAL SPECIAL

PS-SEAL® Abrasive

The PS-SEAL with the lip material made of GYLON® Brown-White Style 3549 is able to achieve significantly better service lives in abrasive media as well as complying to all relevant the food and pharmaceutical industry standards. The unitized multi-layer lip material consists of two calendered and jointly sintered layers, outperforming in crystalline media while meeting EC1935 / 2004, FDA and USP Class VI standards.

PS-PROSET® Cartridge

With PS-PROSET® Garlock offers a sealing unit that serves as the perfect solution for individual cases of applications. Possible application fields for this construction can be mixers, machinery or machine parts where quick service and safety count the most.

PS-PROSET®-Flex

The PS-PROSET® Flex is a cartridge that can take the utmost misalignment and runout by its special design of an integrated compensator.

PS-SEAL® WITH GYLON® BROWN-WHITE

PS-PROSET® CARTRIDGE

PS-PROSET®-FLEX

Garlock
an EnPro Industries family of companies

Leaders in Sealing Integrity

Oil Seals

By retaining lubricants, excluding contamination or separating fluids, KLOZURE® Oil Seals protect bearings and keep processes moving in the most demanding applications.

Model 64

Fifty years of proven success in severe service, large-bore applications. Accommodates the highest speed 35,6 m/s(7,000 fpm) and misalignment/ runout 3,2 mm (0.125") in the industry.

MODEL 64

Model 59

Metal O.D. large-bore seal for moderate to severe operating conditions. Reverse bevel lip allows installation in either direction without rollover.

MODEL 59

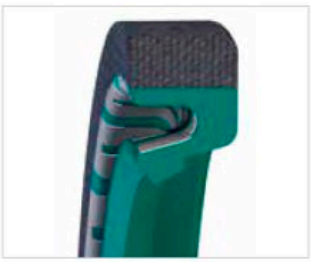
Model 23

The original split seal has saved thousands of downtime hours. More than 300,000 sizes in Mill-Right® N.(Requires a cover plate)

MODEL 23

Model 26

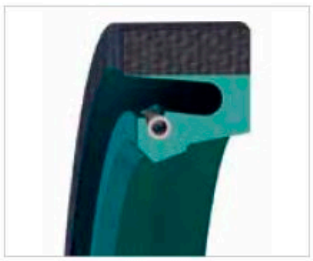
Versatile rubber O.D. seal, available in shaft sizes from 19 mm (0.750") to 1524 mm (60") in solid and split configurations. (Split seal does not require a cover plate)



MODEL 26

Model 154

Single lip General Service oil seal. Captured garter spring prevents roll-out during installation. It is available in both split and solid configurations.



MODEL 154

Model 161-0

Universal Oil Seal in endless design including PTFE-back-up ring. Able to work under pressure up to 5 bar.

MODEL 161-0

Bearing Isolators

These and other Klozure® bearing isolators are used extensively in the chemical, pulp and paper, hydrocarbon processing, power generation and many other industries. Our solutions are customized to your exact specifications.

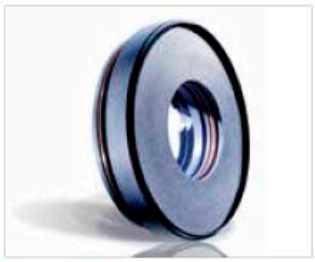
GUARDIAN™

Bronze bearing isolator for non-flooded applications with patented cam-lock system and internal PFTE Unitizing Ring feature. Surpasses all test requirements as specified by IEEE 841-2001.

GUARDIAN™

ISO-GARD®

Unitized PTFE construction of this non contacting, two-piece seal provides excellent chemical and temperature resistance. The ideal alternative to lip seals in non-flooded, oil or grease applications.



ISO-GARD®

Micro-Tec® II

Metallic bearing isolator with a built in air filter designed for applications that require bearing protection in highly contaminated environments.
Utilizes microcellular technology to block out airborne contamination. Performance meets NEMA MG 1-2003 as required in IEEE 841-2001.

MICRO-TEC® II

SGi™

The Garlock SGi incorporates the proven GUARDIAN™ technology with the only maintenance-free shaft voltage mitigation technology, the AEGIS™ SGR.

SGI™

Surface Mounted

The next member to the innovative maintenance friendly KLOZURE® bearing isolator family. Surface Mounted bearing isolator designs eliminate the need to machine bearing housings. When bearing protection is required and time to repair equipment is critical, Garlock Klozure® Surface Mounted Bearing Isolators provide an ideal sealing solution.

SURFACE MOUNTED

Garlock
an EnPro Industries family of companies

Leaders in Sealing Integrity

Compression Packing

The Garlock Advantage

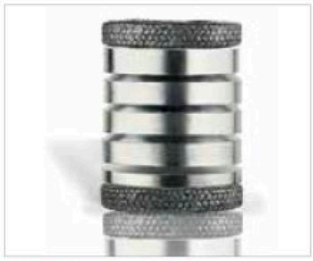
Style 212-ULE™

Better performance than an engineered set in a convenient spool product. Style 212-ULE is easy to cut and install with color coded instructions. Cut inventory dollars and reduce outage schedules without sacrificing performance. Outage planning is easier than ever.

STYLE 212-ULE™

Style 9000 EVSP

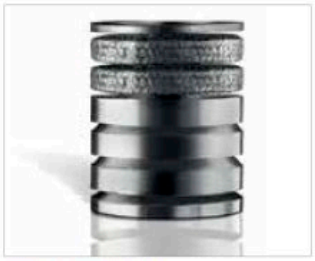
The ultimate solution for environmental protection through reduced VOC emissions. Patented "cup and cone" design permits selective component compression and controlled radial flow, creating an effective seal against both valve stem and bore.



STYLE 9000 EVSP

Style 8093 DSA

Innovative pump packing set engineered for dry running and reduced flush water consumption.



STYLE 8093 DSA

Style 1303-FEP

Braided packing combines flexible graphite with a non-scoring filament jacket for high temperature and pressure applications in the chemical, petrochemical and power generation industries. Fire-safe and compliant with stringent VOC and VHAP emissions regulations.

STYLE 1303-FEP

PTFE

High density, non-porous PTFE continuous fiber resists chemical attack and prevents leakage through the braid. Ideal for valves and pumps in the chemical and food processing industries.

STYLE 5888, 5889, 5898, 5904

SYNTHEPAK®

Lubricated, braided synthetic fiber packing performs well with minimal shaft and sleeve wear. Excellent for general service applications.

STYLE 1925, 8921-K, 8922

Rubber Expansion Joints

Dependable absorption of movements and vibrations in piping system.

Style 204 / 404

Universal compensators, which are characterized by a short design with simultaneous good longitudinal changes in the axial direction. The permissible movement can be adapted to the required range by the number of arches.

STYLE 204 / 404

Style 206 / 306 / 406

This design can be used as a universal, lateral and angular compensator. Its self-flushing arch design eliminates media build up and reduces turbulence. The permissible movement can be adapted to the required range by the number of arches. The pressure range can be extended by the use of inner or outer back-up rings.

STYLE 206 / 306 / 406

Style 8100

These joints are characterized by rotatable flanges, whereby the hole patterns of the two flanges can be offset. They can be used as an universal or lateral compensator. The streamlined flowing arch design reduces turbulence and allows smooth, quiet flow. The permissible movement can be adapted to the required range by the number of arches.

STYLE 8100

Specials

Various customize designs can be realized. Different types, materials and connections can be implemented.

SPECIALS

Butterfly Valves

The economic advantages of reduced maintenance, smooth operation and exceptional service life are proven over and over again. Garlock valves set the standards in TA-Luft DIN EN ISO 15848-1 compliance and are certified with SIL 3 according to EN 61508.

GAR-SEAL

GAR-SEAL valves are used extensively where corrosive, abrasive and toxic media needs to be reliably controlled.

MOBILE-SEAL

MOBILE-SEAL valves are used on road tanker vehicles, railway wagons, silos and other transportation and storage containers where high chemical resistance, reliability and special safety requirements are essential.

SAFETY-SEAL

SAFETY-SEAL valves are used in applications where corrosive, abrasive and toxic media needs to be handled and electrostatic charges must be avoided at the same time.

GAR-SEAL

MOBILE-SEAL

SAFETY-SEAL

STERILE-SEAL

STERILE-SEAL valves are used on duties where sterile processes need to be maintained in the pharmaceutical and food industries without unnecessary and costly overhauls and replacement.

Garlock Actuator

Garlock actuators use the high-quality Scotch-Yoke principle. In comparison to the rack and pinion principle, it features a torque up to 50% higher in the initial and final phase of the switching cycle, while the compressed air consumption is the same.

Mounting Service

As an additional service Garlock offers a mounting service. The GAR-SEAL valves can be ordered as a ready to install unit, with actuator, positioner and switch already mounted.

STERILE-SEAL

GARLOCK ACTUATOR

MOUNTING SERVICE

Garlock
an EnPro Industries family of companies

Leaders in Sealing Integrity

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Garlock PTY
Garlock do Brasil

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Garlock Singapore
Garlock USA
Garlock India Private Limited

Garlock de Mexico, S.A. De C.V.
Garlock New Zealand
Garlock Great Britain Limited
Garlock Middle East

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