

# Garlock Butterfly Valves Quickstart Guide

Trusted throughout the chemical,  
petrochemical & many other industries



## Garlock Butterfly Valves

Trusted throughout chemical, petrochemical and many other industries

### FOR CORROSIVE AND ABRASIVE MEDIA

### Butterfly Valves

Garlock Butterfly Valves are renowned throughout the chemical, petrochemical, process and many other industrial sectors for their quality, performance and reliability in arduous conditions. Garlock valves set the standard in TA-Luft compliance, plus the valves are certified with S1L 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.



**GAR-SEAL**

### STERILE-SEAL

STERILE-SEAL valves are used in applications 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.



**STERILE-SEAL**

### SAFETY-SEAL

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



**SAFETY-SEAL**

### 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.



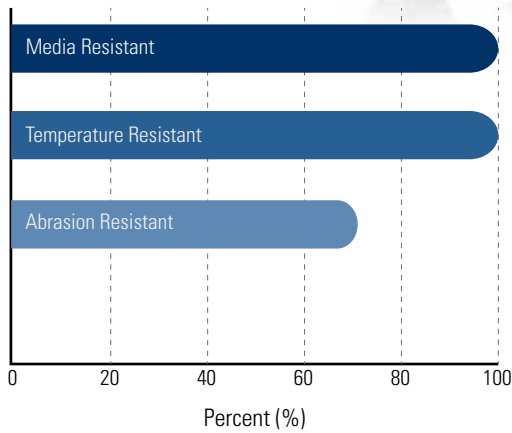
**MOBILE-SEAL**

# Valve Lining

## PTFE

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

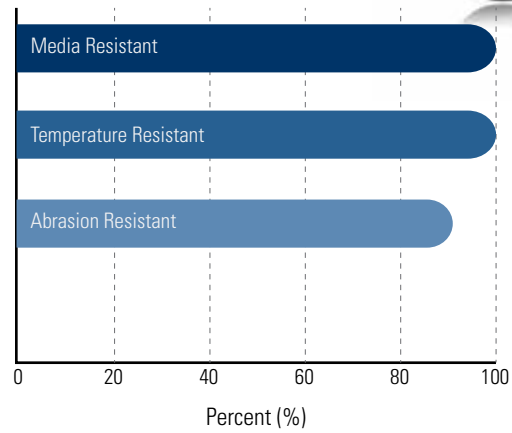
**OPERATING TEMPERATURE:**  
-40°F up to +392°F



## Abrasive PTFE

If the chemical resistance of PTFE is needed along with abrasion resistance, then the use of abrasive service PTFE is recommended. This special PTFE compound is resistant to mechanical wear with almost the same chemical resistance as virgin PTFE.

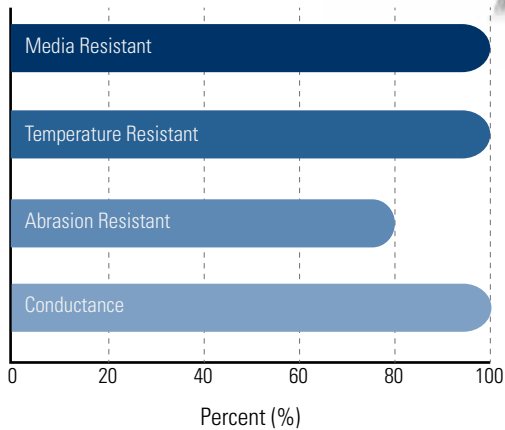
**OPERATING TEMPERATURE:**  
-40°F up to +392°F



## Antistatic PTFE

For explosive environments and medias, this electrostatically conductive lining is available. The service life is comparable to valves lined with PTFE. The material is FDA compliant. TÜV approval. (TÜV 941 F 416 601). Surface resistance ≤ 10<sup>6</sup> Ω. Volume resistance ≤ 10<sup>6</sup> Ω cm.

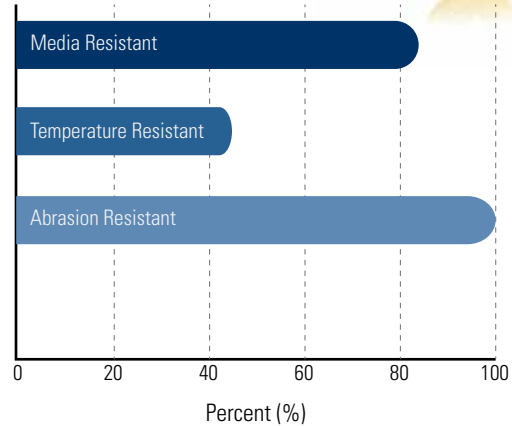
**OPERATING TEMPERATURE:**  
-40°F up to +392°F



## UMPE

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

**OPERATING TEMPERATURE:**  
-40°F up to +185°F



# Material Selection

Valve Material						Design Type					
1 Valve Body		2 Body Liner		3 Disc		4 Specific Design Body Liner		5 Valve Type		6 Body Type	
Code	Material	Code	Material	Code	Material	Code	Material	Code	Material	Code	Material
1	Ductile Cast Iron EN-JS 1049 (0.7043)	1	PTFE**	1	PTFE**	A	Antistatic (SAFETY-SEAL)	V	Vacuum	W	WAFER Ring Body
2	Cast Steel GS-C 25 (1.0619)	2	UHMWPE***	2	UHMWPE***	C	abrasive service	SV	Special vacuum	L	LUG Flange-on- Body
3	Stainless Steel (1.4581)			3	Stainless Steel (1.4581)	S	STERILE-SEAL				MOBILE-SEAL
				4	Hastelloy C* (2.4602)					Code	With existing pipe flanges
				5	Titanium* (3.7035)					W-T	MOBILE-SEAL Wafer
										L-T	MOBILE-SEAL Lug
										W-WT	MOBILE-SEAL Drilling according to DIN 28459

Examples	1	2	3	4	5	6	
GAR-SEAL, WAFER Design	1	1	1	-	-	W	MT
SAFETY-SEAL, LUG Design	3	1	1	A	-	L	MT
MOBILE-SEAL, WAFER Design, acc. to TW standard	1	1	1	-	-	W-WT	MT
STERILE-SEAL, LUG Design, antistatic	3	1	3	S	-	L	
SAFETY-SEAL, WAFER Design, antistatic	2	1	1	A	-	W	MT
GAR-SEAL, WAFER Design vacuum lining	1	1	1	-	V	W	MT

**Performance Data**

- 2" - 24"
- Nominal Pressure  
max. 232 psi (<12")  
up to full vacuum  
(depending upon temperature)
- Operating temperature  
-40°F to +392200°F (for PTFE\*\*)  
-40°F to +185°F (for UHMWPE\*\*\*)
- MT = GAR-SEAL Butterfly Valves  
comply with the TA-Luft regulations.

\* upon request  
 \*\* Polytetrafluorethylene  
 \*\*\* Ultrahighmoleculare Polyethylene

All information and recommendations contained in this catalogue are based on many years of experience and the current state of technology. Unknown factors may, however, limit generally accepted knowledge. Binding statements regarding the compatibility of our products are therefore possible only after practical onsite tests under operating conditions. Information contained in our catalog does therefore not constitute or imply any representation of warrantee. While the utmost care has been used in compiling this catalogue, we assume no responsibility for errors. Specifications subject to change without notice. This edition cancels all previous issues. Subject to change without notice.

# Applications

## GAR-SEAL

GAR-SEAL butterfly valves are used where corrosive, abrasive and toxic media need to be controlled. GAR-SEAL valves are used for controlling, throttling and shutting off purposes in the chemical, petrochemical and chlorine industry as well as in electroplating, the paper industry and many other industries.

### DIMENSIONS

- » 2" up to 24"

### FLANGE CONNECTION

- » ASME B16.5 class 150 lbs (design RF/FF)
- » EN 1092 PN 10/16 (Design A/B)  
(Available upon request)

### FACE-TO-FACE DIMENSIONS

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

### BODY STRENGTH

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

### OPERATING PRESSURE

- » 2" - 12" 232 psi
- » above 12" 145 psi (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 abs. (depending on size and temperature)

### TEMPERATURE RANGE

- » -40 °F up to +392 °F (depending on material)

### HEAD FLANGE

- » EN ISO 5211
- » NF E 29-402

### LINER

- » PTFE
- » Abrasive PTFE
- » UHMWPE

## Applications

### SAFETY-SEAL

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 efforts and extra safety.

### DIMENSIONS

- » 2" up to 24"

### FLANGE CONNECTION

- » ASME B16.5 class 150 lbs (design RF/FF)
- » EN 1092 PN 10/16 (Design A/B)  
(Available upon request)

### FACE-TO-FACE DIMENSIONS

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

### BODY STRENGTH

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

### OPERATING PRESSURE

- » 2" - 12" 232 psi
- » above 12" 145 psi (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 abs. (depending on size and temperature)

### TEMPERATURE RANGE

- » -40 °F up to +392 °F (depending on material)

### HEAD FLANGE

- » EN ISO 5211
- » NF E 29-402

### LINER

- » Antistatic PTFE

# Applications

## 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.

### DIMENSIONS

- » 2" up to 24"

### FLANGE CONNECTION

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

### FACE-TO-FACE DIMENSIONS

- » ISO 5752 Table 5 short
- » ASME B16.10  
(2" to 4" Table Narrow)
- » DIN EN 558-1 GR 20
- » MSS-SP 67  
(2" to 4" Table Narrow)
- » API 609  
(2" to 14" Category A)

### BODY STRENGTH

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

### OPERATING PRESSURE

- » 2" - 4" 145 psi (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 abs. (depending on size and temperature)

### TEMPERATURE RANGE

- » -40 °F up to +392 °F (depending on material)

### HEAD FLANGE

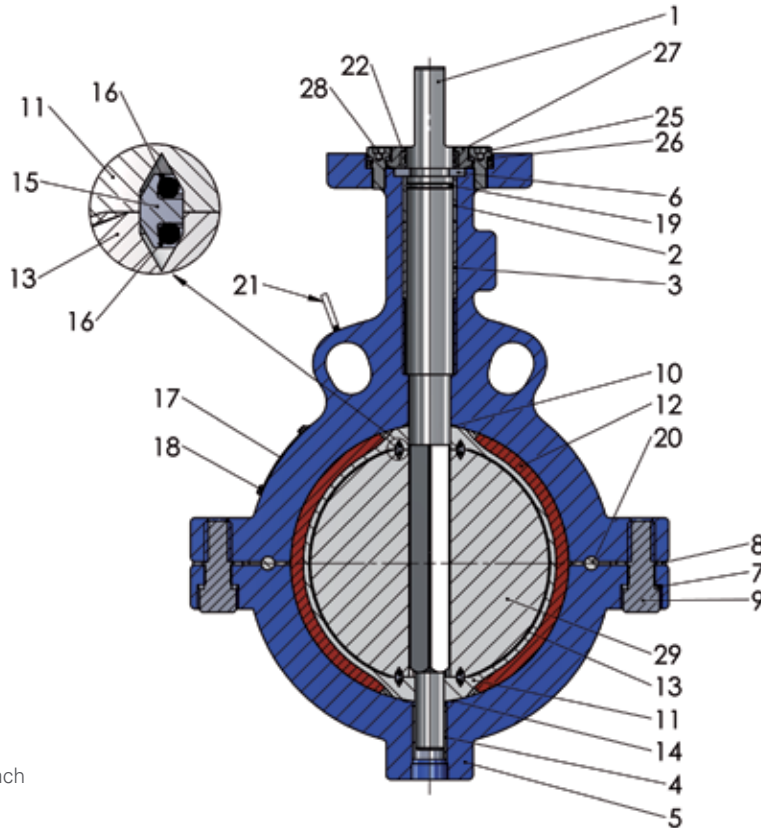
- » EN ISO 5211
- » NF E 29-402

### LINER

- » PTFE

# Materials

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



- <sup>1</sup> does not apply above 10"
- <sup>2</sup> Dimensions > 14" - 4 pieces each
- <sup>3</sup> Special design
- <sup>4</sup> other materials on request

Pos.	Qty	Material	Designation	Pos.	Qty	Material	Designation
1	1	1.4313 up to 12" 1.4021 above 12"	Shaft	15	2	PTFE	Seal ring
2	1	Steel/PTFE	Slide bearing (top)	16	4 <sup>4</sup>	Viton	O-Ring (seal ring)
3	2	Steel/PTFE	Slide bearing (center)	17	1	Stainless Steel	Nameplate
4	1	Steel/PTFE	Slide bearing (bottom)	18	4	Stainless Steel	Rivet
5	1	see material table	Body	19	1 <sup>4</sup>	Viton	O-Ring
6	1 <sup>1</sup>	PTFE, carbon reinf.	Retaining ring (split)	20	2	PTFE	Security element
7	2 <sup>2</sup>	Stainless Steel	Spring washer	21	1 <sup>3</sup>	Steel electrostop	Ground connection
8	2 <sup>2</sup>	GYLON®	Washer	22	2 <sup>4</sup>	Viton	O-Ring (adapter flange)
9	2 <sup>2</sup>	Stainless Steel	Body screw				
10	1	GYLON®	Top gasket	25	4	Stainless Steel	Screw
11	1	see material table	Lining	26	4	Stainless Steel	Spring washer
12	2 <sup>4</sup>	Silicone	Elastomer backup element	27	1	Stainless Steel	Adapter flange
13	1	see material table	Disc	28	1	GYLON®	Seal (adapter flange)
14	1	GYLON®	Bottom gasket	29	1	0.7040 (GGG 40)	Disc insert (only PTFE & UHMWPE lined disc)



# 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.



## DIMENSIONS

- » 2” up to 16”

## FLANGE CONNECTION

- » ASME B16.5 class 150 lbs (design RF/FF)
- » EN 1092 PN 10/16 (Design A/B)  
(Available upon request)

## FACE-TO-FACE DIMENSIONS

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

## BODY STRENGTH

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

## OPERATING PRESSURE

- » 145 psi (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 abs. (depending on size and temperature)

## TEMPERATURE RANGE

- » -40 °F up to +338 °F (depending on material)

## HEAD FLANGE

- » EN ISO 5211
- » NF E 29-402

## LINER

- » PTFE

# STERILE-SEAL

## BACTERIA WON'T SURVIVE

For fermentation, sterile processing is the premise to guarantee the optimum productivity of the microorganisms being used. 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.

## 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

Pressurised 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  $5,7 \times 10^5$ . Pressurised 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.

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.

## 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  $0,1 \mu\text{m Ra}$  are available.

### SHAFT

One-piece manufactured from stainless steel with ring and longitudinal channels. The STERILE-SEAL concept improves the profitability of production processes in pharmaceutical, food and biotechnology industries.

## ADVANTAGES

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

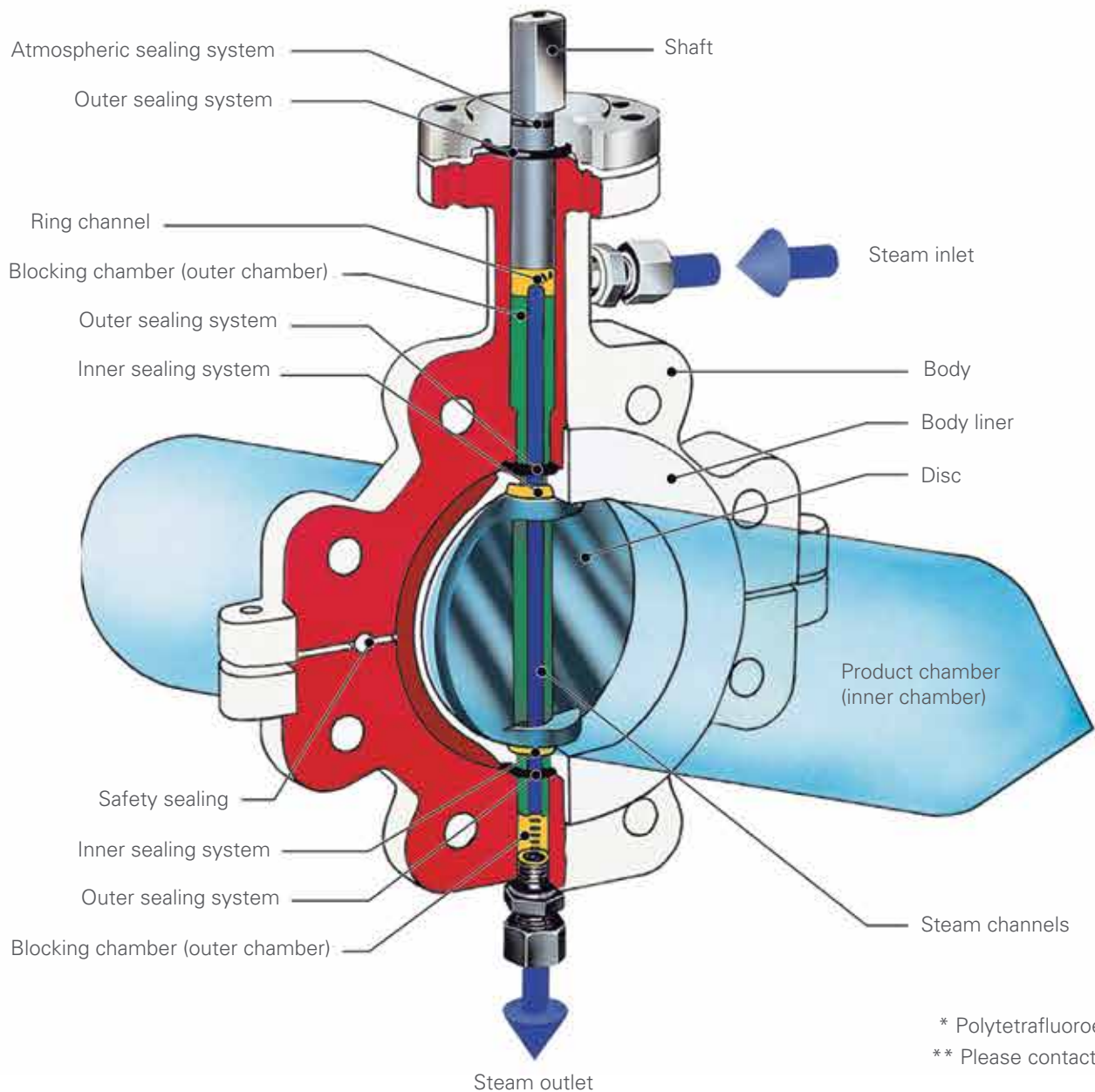
# STERILE-SEAL

## 2 CHAMBER SYSTEM GUARANTEES PRODUCT 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" to 16". Actuators of any kind and type can be mounted.

**SERVICE PRESSURE:** From vacuum up to 145psi

**SERVICE TEMPERATURE:** 40°F to 338°F (392°F\*\*)

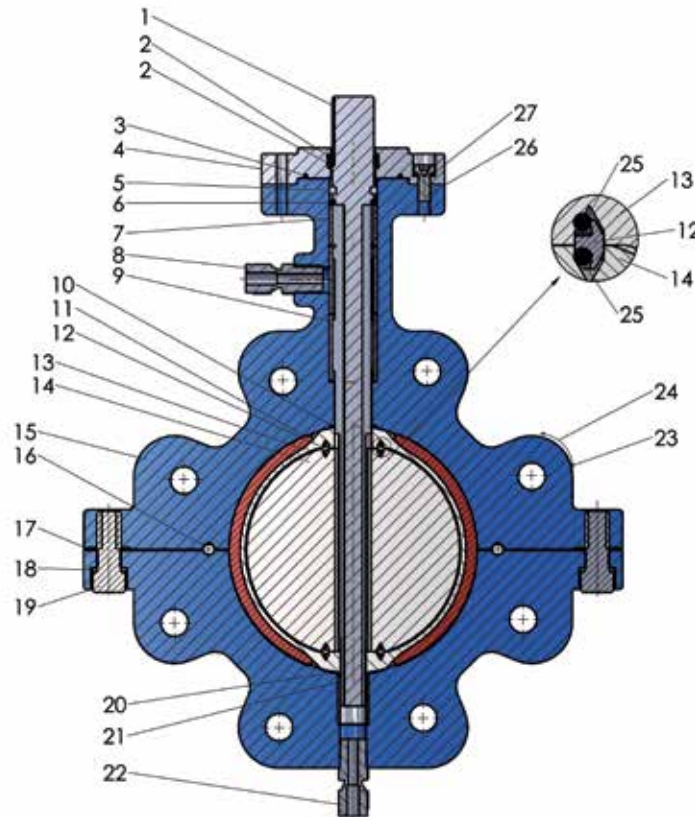


\* Polytetrafluoroethylene

\*\* Please contact Garlock

# Materials

## STERILE-SEAL



<sup>1</sup> does not apply above 10"

<sup>2</sup> > 14" - 4 pc. each

<sup>3</sup> Special design

<sup>4</sup> other materials on request

Pos.	Qty	Material	Designation	Pos.	Qty	Material	Designation
1	1	1.4313 up to 12" 1.4021 above 12"	Shaft	14	1	see material table	Valve disc
2	2 <sup>4</sup>	EPDM	O-ring (shaft)	15	1	s. table	Body
3	1 <sup>4</sup>	EPDM	O-ring (top flange)	16	2	PTFE	security element
4	1	1.4301	Top flange	17	2	PTFE	washer
5	1	PTFE, carbon reinf.	Retaining ring (split)	18	2	Stainless Steel	Spring washer
6	1 <sup>4</sup>	EPDM	O-ring (shaft)	19	2	Stainless Steel	Body Screw
7	1	Steel/PTFE	Slide bearing (top)	20	1 <sup>4</sup>	EPDM	O-ring (liner)
8	1	GYLON®	Fitting	21	1	Steel/PTFE	slide bearing (bottom)
9	2	Stainless Steel	Slide bearing (center)	22	1	Stainless Steel	Fitting
10	1 <sup>4</sup>	EPDM	O-ring (liner)	23	4	Stainless Steel	Groove pin
11	2 <sup>4</sup>	EPDM	Elastomer backup element	24	1	Stainless Steel	Nameplate
12	2	PTFE	Sealring	25	4 <sup>4</sup>	EPDM	O-ring (sealring)
13	1	see material table	Liner	26	4	Stainless Steel	Locking screw
				27	4	Stainless Steel	Spring washer

BV 1:2

### GARLOCK

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