

Garlock

V A L V E S



PROBLEM SOLVING VALVES

- Chemical Processing
- Mining Industry
- Pharmaceutical Systems
- Sterile Systems
- Environmental Hazards
- Petrochemical Processing
- Utilities
- Transportation

Garlock Flange-Mate®

- Eliminate plastic pipe damage due to stress.
- Control compression of the valve liner.
- Center valve automatically
- Eliminate secondary gaskets



Innovative Flange-Mate® Simplifies Proper Installation

The Gar-Seal® Flange-Mate® design uses gauge rings mounted on each of the valve flange surfaces. These rings provide a controlled mounting gap and stable bolting surface between the valve and mating flanges. They also automatically center the valve in the piping. Flange-Mate® helps prevent cracking of FRP pipe flanges and damage to valve liner due to flange rotation or over-compression.

The Garlock® Valve Company

In 1947, we became the first company besides DuPont to process Teflon® PTFE fluoropolymer for industrial sealing applications. Since then, we've earned recognition as a leading manufacturer of problem-solving products for the chemical process industry.

We began manufacturing valves in 1967, when we introduced the Gar-Seal® valve, the first PTFE-lined butterfly valve. Its superior performance in service with the most aggressive and corrosive fluids stems from our in-depth experience with PTFE and innovations in industrial sealing. Over 30 years of continuous improvement have made Gar-Seal® the most reliable and cost-effective lined butterfly valve available anywhere.

Customer Focused

Our approach to valve design, proof testing and manufacturing is customer driven, straight-forward and friendly. We Custom-Craft our products by working together with plant maintenance and engineering to develop new design concepts and proof testing approaches that result in increased valve reliability and reduce the cost of ownership of PTFE, PVDF, UHMWPE, lined butterfly valves in all types of pipe systems.

Assured Component Quality

Because we have a full range of plastics processing capabilities, we are able to make all of our valve components in house. Therefore, we have complete control over production variables, specifications and quality. Based on our experience in manufacturing valve linings and disc coatings, we select the best-performing types of PTFE, UHMWPE, PVDF and molecularly enhanced PTFE resins.

Expert Liner and Disc Coating Selection Guidance:

We've always helped our customers select valve materials that will solve their most difficult application problems. We have customers across many industries, including chemical processing, semiconductor manufacturing, pulp and paper, steel and pharmaceuticals. Thanks to our focus on satisfying all of our customers' needs, we've been rewarded with one of the largest installed base of lined butterfly valves in the industry.

Gar-Seal® Valves – Now Available With Teflon® NXT

With new DuPont fluoropolymer technology, Teflon® NXT delivers all the chemical and thermal capabilities of conventional PTFE with enhanced permeation resistance and lower creep. Molded surfaces are inherently smoother and non-porous. With their unusual thickness, a design feature that helps fight permeation, Gar-Seal® PTFE liners and disc encapsulations take full advantage of lower permeation with Teflon® NXT. With reduced susceptibility to permeation, valves can last longer for reduced cost of ownership.



Gar-Seal Series 122L valve installed in monomer service.

Gar-Seal®: The Right Choice in Lined Butterfly Valves...

- The first PTFE-lined butterfly valve—still the best.
- Full range of sizes from 2" to 42".
- The leader in handling corrosive and abrasive media.
- Specialized plastics engineering and molding for better performance.
- All components manufactured in house for assured quality.
- Most robust valve design in the industry.
- The most reliable stem seal.
- Custom valve solutions to meet customers' requirements.

Heavy Duty Valves Stand Up to Tough Applications:

■ Durable liner walls

Our valves are manufactured with a minimum wall thickness of 0.125 in. (>3 mm) at all media contact areas.

■ High permeation resistance

Our proprietary high-pressure molding process helps eliminate micro-voids, porosity, laminations and inclusions that allow permeation. Our advanced technology for plastic liner and disc encapsulation help eliminate defects that can occur when other manufacturing methods are used. We closely control sintering temperatures for PTFE to produce a highly crystalline and dense polymer structure that resists permeation and abrasion damage.



■ Assured Lining and Encapsulation Quality

Every Gar-Seal® disc and liner is subjected to a demanding 50,000-volt spark test. 100% testing for defects helps assure trouble-free service. Other manufacturers may test at a lower voltage.

■ Robust Stem Design to Fight Shearing

Our single piece valve stem and the most robust valve disc in the industry work together to virtually eliminate disc or stem shearing. Stems are made from high-grade 17-4 pH stainless steel. You won't find our valve disc somewhere down the process stream.

■ Positive Shutoff

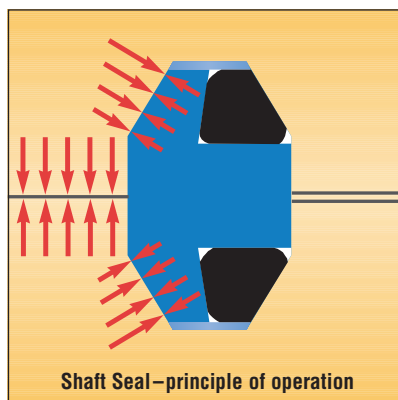
Our disc and stem arrangement provides trouble-free rotation and assured shutoff. Depending on valve size, stems are square in cross section through the disc or double keyed inside the disc. This design provides for a stiff disc and shaft assembly that virtually eliminates bending and seal distortion. A common problem with other constructions that employ integral stem and disc configurations.

■ Rigid Shaft Support Protects Stem Seals

Stem seal support is critical to stem seal integrity. Our shaft bearings are heavy-duty Garlock DU® PTFE -impregnated bearings. Multiple bearings at the top and bottom of the disc provide rigid support for the valve shaft, thus eliminating destructive side load distortion of the stem seals. Our seals won't burp due to pressure surges or dynamic flow characteristics.

■ Blocks Fugitive Emissions – Even After 10,000 Cycles

Our proprietary "live loaded" stem sealing system is a combination labyrinth seal, compression seal and rotary seal. This field-proven seal is machined to fit between the disc and liner. Whether at steady state or cyclical temperatures, our seal has been proven to meet and exceed EPA guidelines even after 10,000 cycles. The entire unit is double-loaded with our standard Viton® fluoroelastomer or special-order Kalrez® perfluoroelastomer O-rings in combination with our PTFE seal energizer backup-ring. See diagram below.



■ Withstands Aggressive Environments

An updated design prevents atmospheric incursion that can cause internal damage. A seal of Viton® is mounted on the top portion of the valve shaft and precision die-cut Gylon® gaskets seal the body halves. These sealing components have been tested under extreme conditions to insure top performance.

■ Traceability

A unique serial number on each valve body guarantees traceability. At any time, this number tells a customer that the valve has passed our strenuous in-house quality assurance tests. Using the number, we can provide information about the valve's compliance with national and international standards.



Materials

The GAR-SEAL valves are available in five different corrosion resistant materials. Discs are available in different metal alloys, too. For all operating conditions a combined quality and safety level is achieved.

Design Criteria to Meet Your Most Demanding Applications

Pressure Rating:

From vacuum to 150psi (10bar) bi-directional for bubble-tight shutoff. Testing in accordance to MSS & API specifications.

Temperature Rating:

From -40°F (-40°C) to +400°F (+200°C)

Body Style:

Wafer or Lug

Flange Rating:

ANSI B16.5 Class 150LB Weld Neck or slip-on. DIN, JIS, BS standards also available.

Face to Face:

Garlock standard or ISO 5752

Material	Body	Liner	Disc
VIRGIN PTFE (Polytetrafluoroethylene)		◆	◆ ¹
MODIFIED PTFE		◆	◆ ¹
PVDF (Polyvinylidene Fluoride)		◆	◆ ¹
UHMWPE (Ultra High Molecular Weight Polyethylene)		◆	◆ ¹
ANTISTATIC PTFE		◆	◆ ¹
DUCTILE IRON A395	◆		
316 SS	◆		◆ ²
HASTELLOY B, C			◆
ALLOY 20			◆
TITANIUM			◆

¹ 2" - 6" Valves, material encapsulated over 304 stainless steel
ASTM A351-CF8

¹ 8" - 42" Valves, material encapsulated over ductile iron
ASTM A395

² 2" - 24" Valves, material is a standard cast finish, also available
in mechanical polish and electro-polish

Fluoroelastomer o-ring for environmental seal

Anti blowout shaft retention screw

Simple and effective shaft seal has shown, through independent testing, less than 1.5 ppmv leakage after 10,000 operating cycles and severe thermal cycling.

Geometric and dimensional profile provide reduced interference between disc and liner, resulting in lowered operating torques.

Upper and lower PTFE non lubricated DU® bearings support stem loads and limit shaft deflection.

Single piece valve stem made from 17-4ph stainless steel to withstand shearing.

Resilient 360° silicone or Viton® elastomer back-up ring is dynamically loaded to ensure precise, uniform loading of the liner/disc and seal assemblies, providing up to 50% reduction in operating torque and leak free operation.

Stainless or ductile iron disc insert overmolded with PTFE.

PTFE molded by proprietary Garlock manufacturing process assures high crystallinity, which results in increased permeation resistance. Minimum PTFE thickness of .125" (>3mm).

Rugged 2 piece field repairable ductile or stainless body.



Gylon® full face gaskets eliminate any potential for ingress of atmospheric contaminants. Eliminates potential leak path of line media.



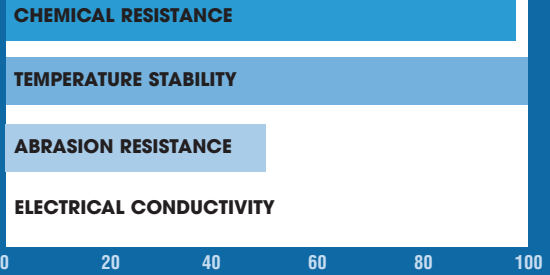
Patented 3-seal Garlock stem seal assembly combines compression, labyrinth, rotary seal concepts into one seal approach. Viton® O-rings and back-up ring supply dynamic live loading.

General Application & Selection Guide



PTFE

Void-free body liner and disc encapsulation isostatically molded from virgin PTFE. High density and crystallinity: >2.16gm/cm³. Excellent chemical resistance. Minimum liner and encapsulation thickness of 0.125 in. (>3mm) on all wetted parts.
 Operating temperature:
 -40°F (-40°C) to +400°F (+200°C)



Teflon® NXT

Teflon® NXT - Void-free body liner and disc encapsulation isostatically molded from virgin molecularly enhanced PTFE. Superior resistance to cold flow and increased permeation resistance. Particularly suitable for monomer service at elevated temperatures. High density and crystallinity: >2.16gm/cm³. Minimum liner and encapsulation thickness of 0.125 in. (>3mm) on all wetted parts.
 Operating temperature:
 -40°F (-40°C) to +400°F (+200°C).



PVDF

Body liner and disc encapsulation molded from virgin PVDF. Bromine resistant. PVDF is a high density thermoplastic fluoropolymer with higher strength and abrasion resistance than other fluoropolymers. Creep and chemical resistance for PVDF is exceptional, and it has low metallic ion extractibles and resists particulate shedding.
 Operating temperature:
 -40°F (-40°C) to +275°F (+135°C).



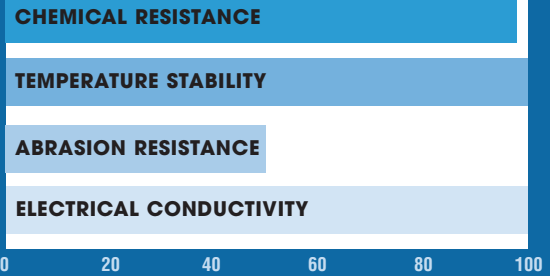
UHMWPE

Body liner and disc encapsulation molded from a proprietary polymer blend that complies with FDA requirements. The extremely high molecular weight of this material provides maximum abrasion resistance plus exceptional chemical resistance. Minimum liner and encapsulation thickness of 0.125 in. (>3mm) on all wetted parts.
 Operating temperature:
 -40°F (-40°C) to +180°F (+82°C).



ANTISTATIC PTFE

Void-free body liner and disc encapsulation isostatically molded from a proprietary blend of filled PTFE (<1.5%) for electrostatic conductivity, high density and crystallinity - >2.16gm/cm³ - and excellent chemical resistance. Material can be certified to meet FDA compliance. Particularly suited for solvent recovery systems. Minimum liner and encapsulation thickness of 0.125 in. (>3mm) on all wetted parts. Surface resistance <10⁶Ω. Volume resistance <10⁶Ωcm.
 Operating temperature:
 -40°F (-40°C) to +400°F (+200°C).



Actuation and Automation

Garlock butterfly valves are an excellent engineering choice for throttling control. We can provide many accessories for manual, automatic or remote operation.

Manual Operation

Our manual operators are designed to meet many of your plant requirements. Gar-Seal® valve handles are epoxy-coated iron, complete with a 10-position notched plate for throttling or shut off. At no additional charge, an integral lockout feature is included to meet OSHA requirements.

Our manual gear operators are epoxy-coated iron, fully lubricated and equipped with a standard fluoroelastomer seal package to keep out the most aggressive environments. Because almost no maintenance is required, costs are reduced and service life is extended.

Additional manual accessories include chainwheel assemblies, lock-out mechanisms, limit switch indicators, stem extensions ...all engineered to fit and function seamlessly in your process.

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Teflon® is a registered trademark of DuPont.

Viton® and Kalrez® are registered trademarks of DuPont Dow Elastomers.

DU® is a registered trademark of Garlock Bearings.

Accessory Types:

- Pneumatic Actuators
- Positioners
- Electric Actuators
- Transducers
- Hydraulic Actuators
- Limit Switches
- Stem Extensions

Valve Automation

Garlock provides one-stop shopping for valve automation. Equipment for automatic, fail-safe or remote operation can be designed, mounted and calibrated by our trained personnel. We offer pneumatic, electric or hydraulic actuators for on/off, throttling and fail-safe control along with visible indicators for position identification.



Photograph of Gar-Seal 42" 100F series valves.

This information should be used as a guide for your consideration, investigation, and verification. This information does not constitute a warranty or representation and we assume no legal responsibility or obligation with respect thereto, and the use to which such information may be put.

Garlock Valves

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