

# Sealing Integrity for the Pharmaceutical Industry



Leaders in Sealing Integrity

**Garlock**  
an EnPro Industries family of companies





## Meeting and Exceeding your **Most Rigorous** Sealing Requirements.

GARLOCK® seals help make life better for millions of people around the globe. They play an important role in assuring the safety of medications, food, beverages, cosmetics and many other consumer products. Process engineers and professionals working in Quality, Operations and Maintenance trust the Garlock family of companies to develop Pharmaceutical and Bio-Pharmaceutical industry sealing solutions for a broad range of applications, including hygienic pipework, reaction vessels, blenders and mixers, ultra-pure water systems, valves and pumps.

Dependable, state-of-the-art Garlock seals, gaskets, diaphragms and valves meet key operational needs with excellent chemical resistance and remarkably long service life. Garlock is dedicated to guaranteeing the integrity and reproducibility of the products you create.

# A Culture of Safety

Garlock is the global leader in high-performance fluid sealing products. This leadership includes the commitment to a culture of safety and the dedication to making the world a safer, more sustainable and reliable place to live.

Our safety focus stems from our workplace culture and adherence to sealing integrity. We embrace safety both for our employees and our customers. Garlock sealing products and solutions are tested to meet or exceed industry regulatory requirements. Our goal is to go beyond compliance to set a higher standard that defines who we are and what we stand for.



# Quality and Compliance are a Top Priority for Pharmaceutical Applications.

In today's pharmaceutical and bio-pharmaceutical industries, cleanliness, traceability and compliance with international regulatory standards are essential for risk management. Employing durable, high-performance and precisely engineered sealing solutions is imperative to meeting these goals and preventing process material contamination.

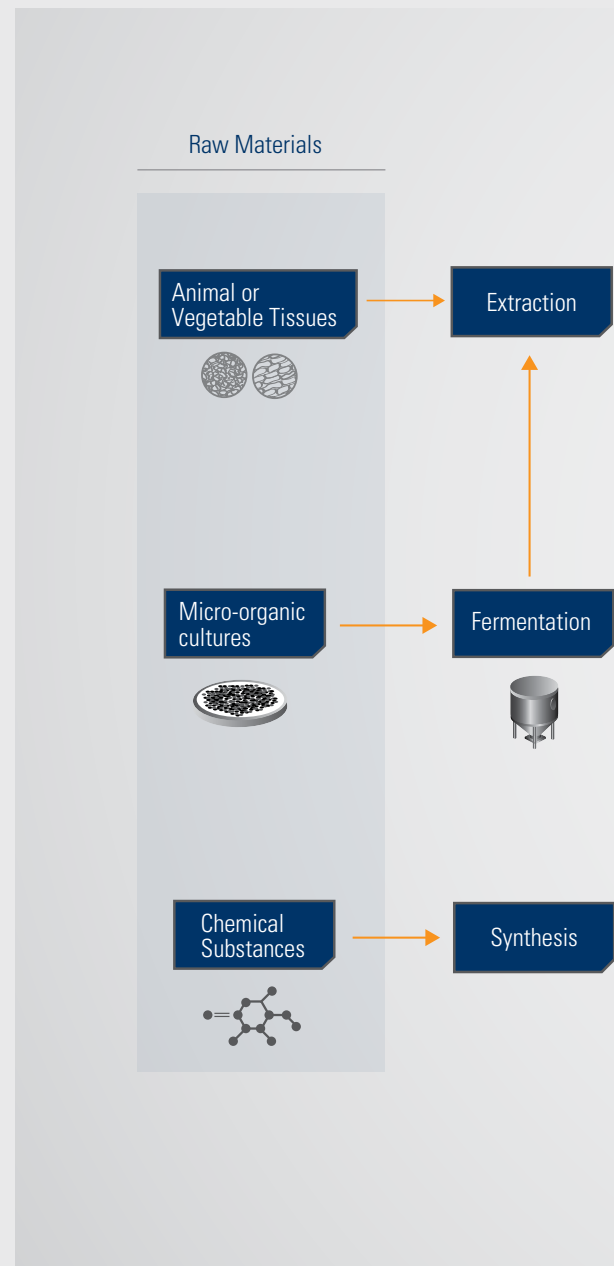
Garlock assists in this critically important task with sealing products that conform to the highest international regulatory standards, including:

- » FDA 21 CFR 177.1550 for fluorocarbon plastics
- » FDA 21 CFR 177.2600 for elastomers
- » (EU) 1935/2004
- » 3-A sanitary standards 18-03 and 20-27
- » USP Class VI and Chapter <87> and <88>
- » NSF/ANSI standards 51 and 61 for food equipment materials and drinking water systems

Pharmaceutical and bio-processing equipment represents a broad range of applications and operating conditions. Garlock's seal designers and engineers are constantly innovating better ways to comply with the full spectrum of regulatory requirements.

# Sealing Products for the Pharmaceutical Industry

From raw materials to final packaging, Garlock engineers and manufactures a comprehensive range of sealing solutions specifically for the varied conditions and materials used in pharmaceutical and bio-pharmaceutical production. Our applications engineers and technical experts work in close partnership with our customers to understand the complexity of their operations and the diversity of their sealing challenges; only then do we begin to prescribe specific products to meet their requirements.

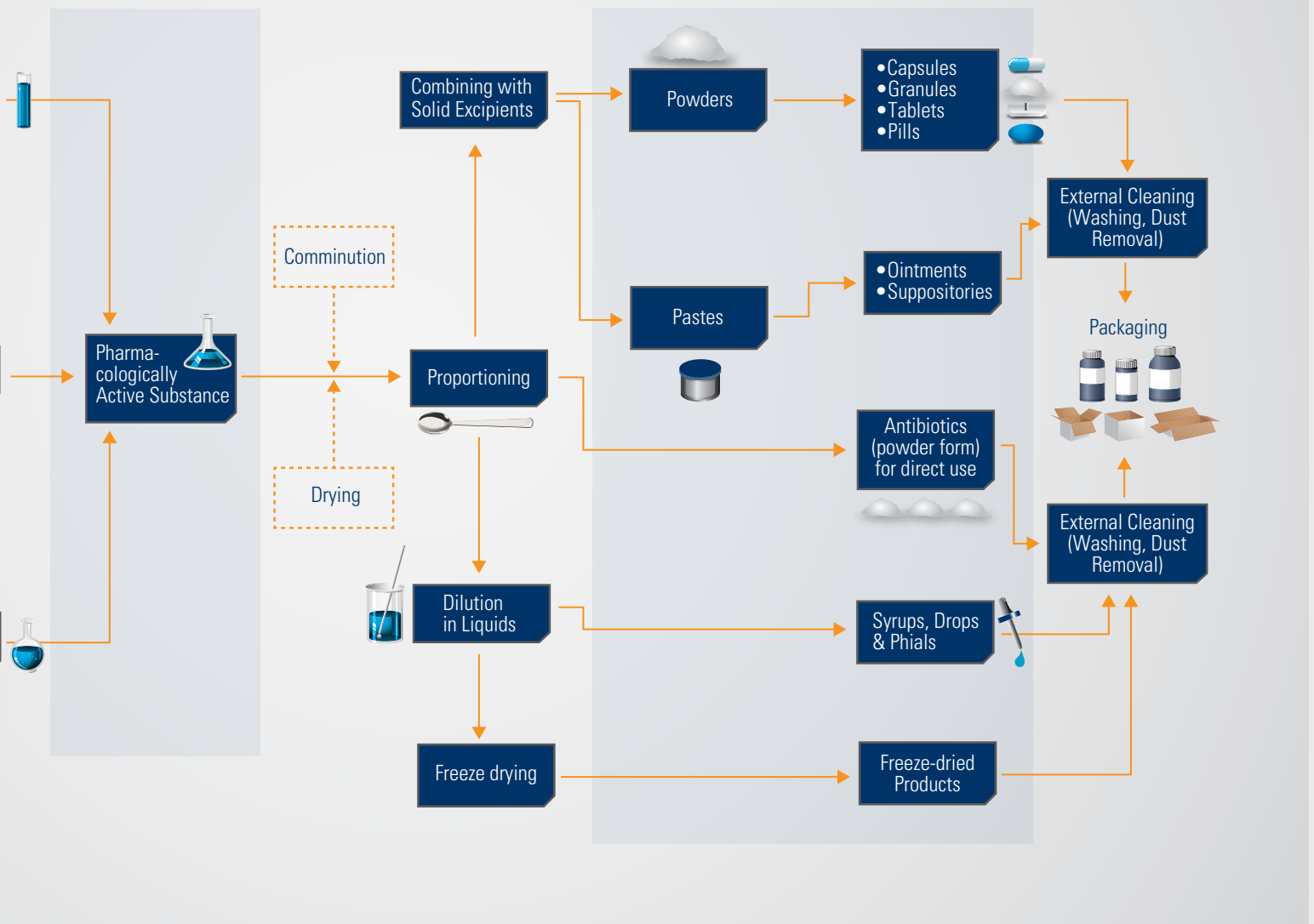


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GYLON® standard gaskets and GYLON BIO-LINE® sanitary gaskets are well-suited to production of APIs (active pharmaceutical ingredients) and intermediates, with excellent temperature and chemical resistance in the most aggressive of CIP/SIP regimes.

Pharmacological Substance

Final Form

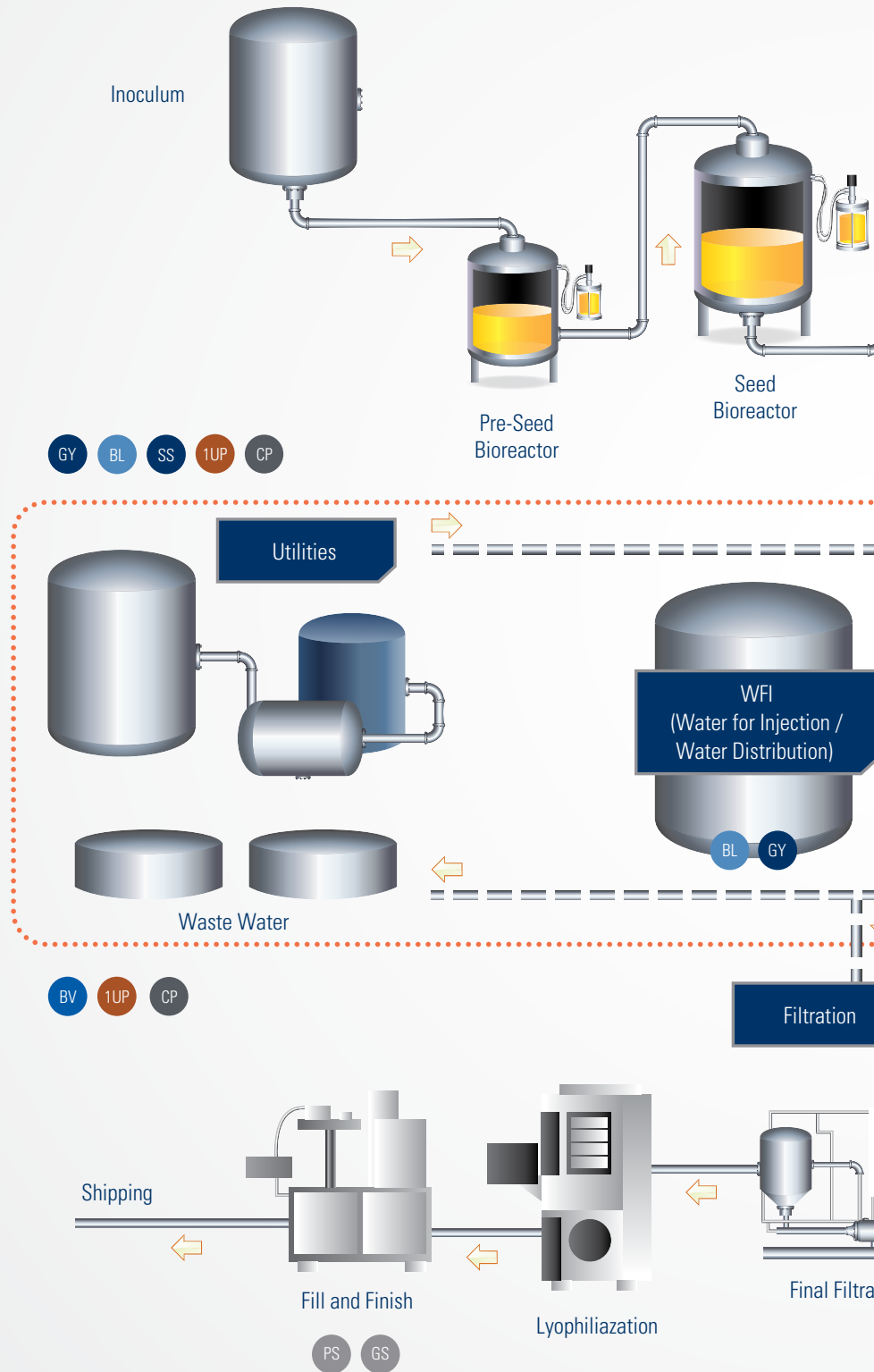


**2** The wide range of final formulation processes calls for both fluid and powder sealing solutions on both static and dynamic applications. Products such as PS-SEAL® and KLOZURE® bearing isolators all provide excellent compatibility and durability in any number of challenging applications.

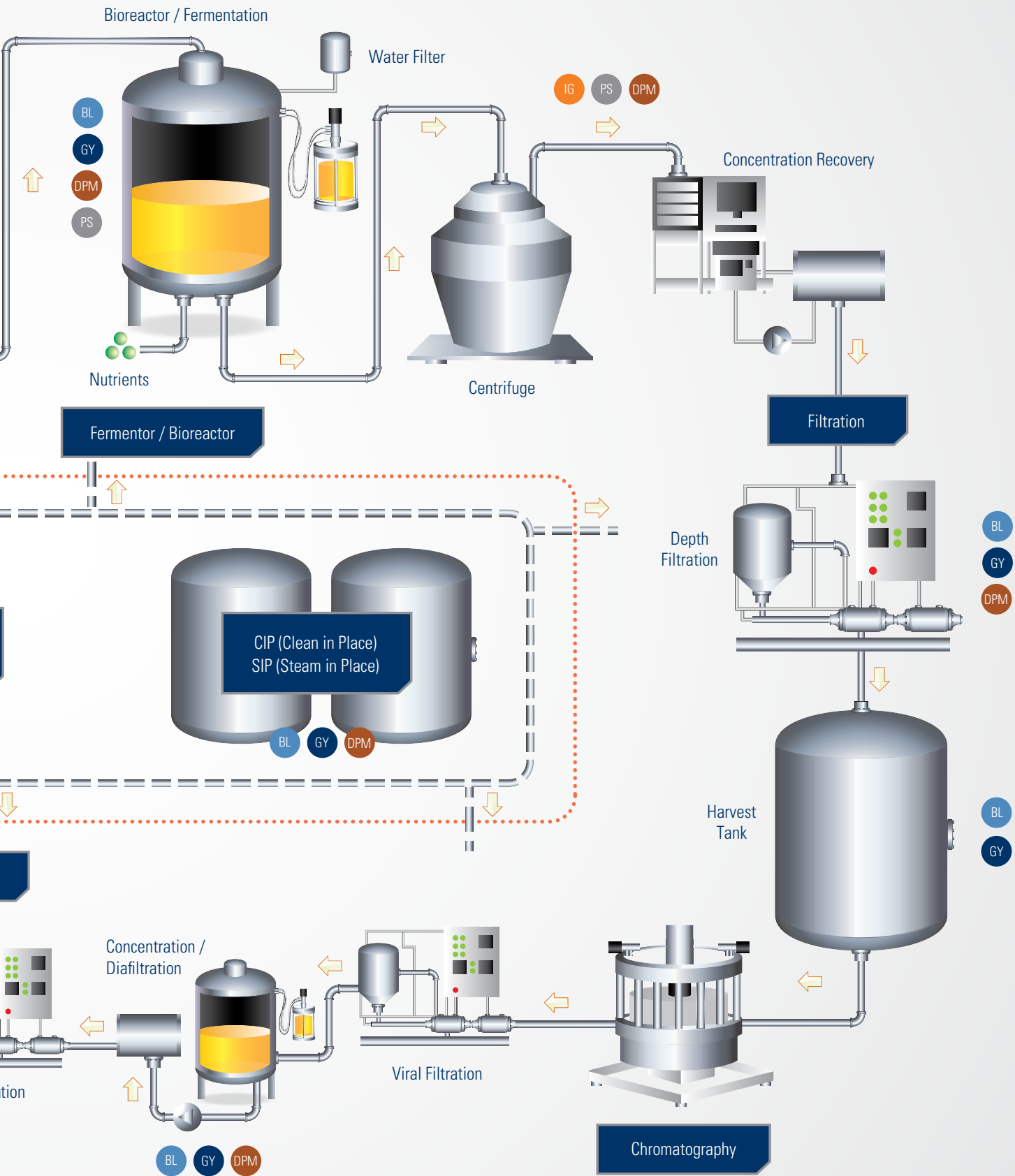
**3** Fill and finish operations demand some of the most critical conditions in the whole pharmaceutical process. GYLON® diaphragms are ideal for aseptic valve applications, while GAR-SPRING seals provide reliable shaft sealing on filling carousels.

# Bio-Pharmaceutical Manufacturing Product & Application Recommendations

Key	
Sanitary Gaskets	
BL	GYLON BIO-LINE® GYLON BIO-LINE® PLUS GYLON BIO-LOK® GARLOCK PRO-CLAMP
Gaskets	
GY	GYLON®
SS	STRESS SAVER®
Dynamic Seals	
PS	PS-SEAL®
GS	GAR-SPRING
Bearing Isolators	
IG	ISO-GARD®
Butterfly Valves	
BV	GAR-SEAL or STERILE-SEAL
Diaphragms	
DPM	GYLON® Diaphragms
1UP	GYLON® ONE-UP® Pump Diaphragms
Compression Packaging	
CP	PTFE Packing (Styles 5904/5906)







# Sanitary Gaskets

## Performance materials for demanding applications

Our sanitary gasketing products are based on GYLON®, a modified and restructured PTFE material. This gaskets better withstand the harsh conditions found in many pharmaceutical applications and also resist intrusion, which can lead to material contamination and flow irregularities..



### GYLON BIO-PRO®

GYLON BIO-PRO® gaskets are pre-formed to fit Tri-Clamp type joints precisely and ensure a smooth 'no trap' internal surface. Dimensionally stable over a wide range of process temperatures, GYLON BIO-PRO® gaskets do not creep or relax and lose their high-integrity seal. Meets EN 1935/2004, USP Class VI, FDA compliant and KTW approved.



### GYLON BIO-ASEPT®

For aseptic flange connections in accordance with DIN 11853 and DIN 11864 (Form A), GYLON BIO-ASEPT® seals offer high stability and a specific elasticity. Our seals are pre-formed and stress controlled for solid sealing in piping systems. High performance PTFE sealing materials prevent chemical degradation or brittleness, even under ever-increasing process and sterilization demands.



### 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 SMS 1149. All of the disadvantages associated with standard elastomeric seals regarding temperature, chemical resistance and re-usability are eliminated by the modified PTFE material. GYLON BIO-ECO® seals are available in all dimensions without inner collar (M1) or with inner collar (M2).



### 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.



### GYLON BIO-LOK®

Camlock connections are the standard connection for quick coupling in many industries. 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.



### 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-torquing and holds up the ideal sealing point at all times during the process preventing the accumulation of process media.

# Gaskets

## Positive Seals and Proven Reliability

Our gasketing products are offered in a wide range of PTFE materials, including GYLON® modified and restructured PTFE gaskets, an industry standard for resistance to aggressive chemicals.



### **GYLON®**

GYLON® gaskets deliver improved performance over conventional PTFE. GYLON® advantages include reduced creep relaxation and the ability to withstand a wide range of chemicals for extended service life in a wide range of applications.



### **GYLON® Style 3504 STRESS SAVER®**

Since 1996, Garlock has successfully sealed low load flanges with our STRESS SAVER® family of products. The molded raised ribs help to create a tighter seal by concentrating the compressive load, making STRESS SAVER® ideal for light-weight piping. Our Style GYLON® Style 3504 STRESS SAVER® combines these proven sealing advantages with the performance characteristics of the industry recognized GYLON® 3504.



### **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.

# Dynamic Seals

## Specialty seals for challenging applications

Garlock's dynamic seals are engineered to meet the demanding temperature and chemical requirements of challenging and specialized pharmaceutical applications, including bioreactors, centrifuges and fill and finish operations.



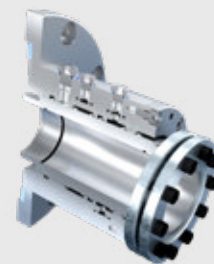
### PS-SEAL®

High performance PS-SEAL® products operate with a sealing lip of modified PTFE, making them highly elastic and flexible with a very low coefficient of friction. They suffer little wear and require no metallic spring element. PS-SEAL® is specially designed for reliably sealing rotating shafts with high peripheral speeds, high pressure, temperature fluctuations and aggressive media.



### 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.



### ISO-GARD®

ISO-GARD® bearing isolators provide excellent chemical resistance within a wide temperature range, making them suitable for bearing protection in many applications. A press fit design allows for ease of installation without the use of tools, reducing production downtime and saving maintenance costs. As with all Garlock Isolators, ISO-GARD® comes in a variety of configurations; both flanged and non-flanged designs are available.



### GAR-SPRING

GAR-SPRING products are suitable for a wide variety of uses including Rotary and Static applications. GAR-SPRING is primarily PTFE, energized by either springs or elastomer material. GAR-SPRING is designed to withstand temperature extremes ranging from cryogenic temperatures up to 340 °C.

# Butterfly Valves

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## Quality regulation for maximum productivity

Regulation of caustic, abrasive and aggressive chemicals and materials can prove challenging in pharmaceutical operations. Garlock's GAR-SEAL and STERILE-SEAL butterfly valves provide the performance and maintenance features needed to ensure material integrity and maximize uptime.



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### **GAR-SEAL**

GAR-SEAL valves are used for accurate control, throttling and shut-off duties where corrosive, abrasive and toxic media must be reliably controlled. GAR-SEAL butterfly valves offer reduced maintenance requirements and increased operational reliability over competitive products.



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### **STERILE-SEAL**

STERILE-SEAL valves are used in the pharmaceutical and bio-pharmaceutical industries to maintain a sterile environment without the need for unnecessary and costly overhauls and replacements. The special characteristic of this valve is its external sterilization capability. The design allows the critical "dead" areas of the valve, along with the disc, body liner and seals, to be steam sterilized without the risk of contaminating the material being processed.

# Diaphragms

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## Innovative designs for long life & less maintenance

Garlock's proprietary materials and designs and high-quality construction give our diaphragms exceptional service life and reduced maintenance for a wide variety of pharmaceutical applications. From pure PTFE to one-piece bolt-on PTFE-bonded rubber diaphragms, if you have a difficult or critical application, Garlock has the diaphragm to meet your needs.



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### **GYLON® ONE-UP® Pump Diaphragm**

Made using our exclusive GYLON® PTFE Diaphragm material and a proprietary EPDM rubber backing, this product has the same patented rib construction of our standard industrial ONE-UP® and complies with FDA regulations.



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### **GYLON® PTFE Diaphragm Style 3522**

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

# Compression Packing

## Cutting edge technology for changing demands

PTFE compression packing is known for its exceptionally high resistance to chemicals and low friction, and provides excellent performance in terms of leakage control, service life and dependability. Garlock's compression packing is rigorously tested to ensure reliable, cost-effective sealing in valves, pumps, agitators and other rotary equipment.



### **PTFE Packing Style 5904/5906**

Style 5904 is made from high purity PTFE filament lubricated with mineral oil – both of which conform to USDA and FDA standards. It is also highly chemically resistant and suitable for use in caustic service. Style 5904 is recommended for use in rotary food processing equipment such as pumps, dryers, blenders, mixers and cookers as well as acidic mining pumps.



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GARLOCK GMBH

an *EnPro* Industries family of companies

Falkenweg 1, 41468 Neuss, Germany

Tel: +49 2131 349 0

Fax: +49 2131 349 222

[www.garlock.com](http://www.garlock.com)



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